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THE MASTER PLUMBER'S OPPORTUNITY FOR CHRISTMAS BUSINESS.

THE OPPORTUNITY for Christmas business is at hand. Merchants and retailers are busy preparing their show windows for interesting and attractive displays of goods for the holidays and investing money in additional space in the advertising sections of the daily newspapers.

The dry goods man, the clothier, the sporting house and numerous others are striving hard to please and catch the eye of the Christmas shopper. They are all bent upon helping Santa Claus to deliver the goods this year.

But what about the plumber? Amid this hustle and preparation among merchants, what action is he taking to secure some of this Christmas business? How many in the trade are launching special drives for holiday customers?

Many master plumbers would answer in the negative—that they have made no effort to arouse public interest in the installation of sanitary plumbing fixtures as the best kind of Christmas present in the home.

Those in the trade, who are doing residence work, and who are depending largely upon the property-owning public for patronage, can arouse interest in the community through attractive window displays and well-planned holiday newspaper advertising.

A southern plumbing contractor recently wrote to the editor, that he was lining up with the other merchants in his town in a drive for Christmas business. He stated that he has arranged a window display with night illumination, which he believes will be effective as a sales promotor. He wrote:

"I am showing an up-to-date bathroom outfit in one part of my window, and a model sanitary kitchen apparatus in the other. I have decorated the window with holly and patriotic emblems, and the entire effect is calculated to catch the eye of the Christmas shopper. I carry bathroom accessories of all kinds and vacuum-cleaning outfits. I feel that my window reflects the Christmas spirit and that it ought to interest the public generally. Some of the posters in the window read as follows: 'To the Father Who Loves His Family. Present the Folks with a Sanitary Christmas Gift. Give Them a Modern Bathroom. Bathroom Accessories as Gifts For Christmas. A Choice Assortment For Your Inspection.'"

This plumbing contractor is to be congratulated upon his enterprise in seeking to make the most of the holiday season, and we shall be interested to learn the extent of his success in this respect. He will doubtless find that his efforts have been well spent and that he has started a campaign of education in favor of Christmas presents that are really useful.

The Christmas season is an opportune time for advertising goods of all kinds. There is every reason for assuming that the plumbing and heating contractor can increase his business possibilities by making the best use of the holiday season.

Considering the fact that the present war economy has tended toward retrenchment in the purchase of many things, the plumbing and heating contractor can show in his newspaper advertising that there is no waste or extravagance in the investment of money in plumbing and heating goods. He can point out that a great amount of money is diverted into the channel of useless gifts, and that it would be both economy and wisdom to invest in articles of practical value. Some artistic looking bathroom accessory for the home would be far more sensible as a gift than many of the average presents.

Something About Ice and How It Affects the Plumbing Trade

How Some Pipes Freeze and Burst, While Others Freeze and Do Not Burst

By JOHN H. PERRY

IN this short article on Ice, it would seem preposterous to tell plumbers what ice is, and how it is made. One would think that every American schoolboy knows that much. But in order to make a complete treatise and to enlighten such readers of "Domestic Engineering" as may reside in the warmer portions of our great country, we will begin at the very beginning.

Ice is nothing but water that has been cooled so much that it has become solid.

All water, and, indeed, all ice, contain heat. For example, a pound of water at 60 degrees F. contains 28 British thermal units of heat more than does a pound of water whose temperature is 32 degrees F. If you figure that out you will find that it represents one thermal unit, or B. t. u. for short, to every degree difference in temperature. But we may talk about this B. t. u. business later. In the meantime let us realize that a B. t. u. is the quantity of heat required to change the temperature of one pound of water one degree by the Fahrenheit scale of measurement.

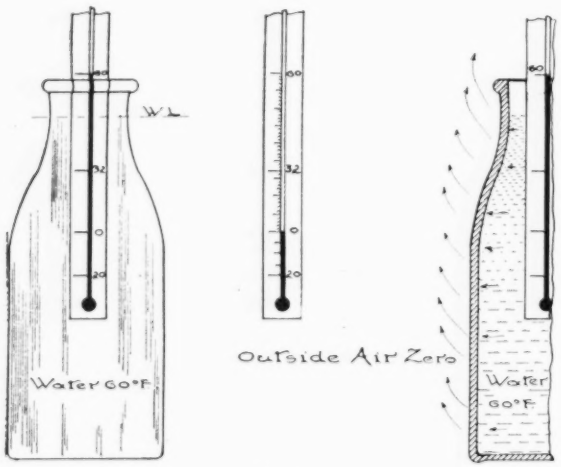


Fig. 1.

Now, suppose we proceed to try an experiment. Let us make ice. And in the making, let us study the whole process from a scientific standpoint. Then, when we have grasped the fundamental principles, and really are familiar with the wonderful laws of nature that come into play so faithfully and so forcefully, let us see how ice affects us in the plumbing business.

Take a milk bottle and fill it with water up to the neck, the temperature of the water being 60 degrees F. Place this outdoors where you can see it, say on the window sill, when it is freezing outdoors. Hang a thermometer in the bottle something like Fig. 1, and let the bottle stand there. Hang another thermometer near the bottle, and watch results.

Suppose the outside air is zero, then the thermometer will soon settle down and read the same as in Fig. 1.

But owing to the fact that the air is colder than the water, and owing to another law of nature relative to the equalization of temperatures by heat transmission, it follows that heat flows from the warmer water to the colder air around it. This heat goes out through the glass bottle, as shown by arrows in section view at right hand of Fig. 1. The water in bottle is hot water as compared with the temperature of the air around it. There is a temperature difference of 60 degrees F. This is the same temperature difference that exists between the 70 degree F. air in a room and a hot water radiator at 130 degrees F.

Of course, you can stand in a zero atmosphere and place your hand on the water bottle without feeling much temperature difference, while you cannot stand in a 70 degree room with your hand on a 130 degree radiator without nearly burning your hand. But the temperature difference is there just the same. It requires thermometers to show it correctly.

The flow of heat from water bottle to its colder surroundings in Fig. 1 will continue until the bottle, the water and the surrounding air are all the same temperature. But it will take time to accomplish this, as there is a considerable quantity of heat in the water which must first be transmitted through the glass to the outer air.

As the experiment proceeds it will be found that the mercury of the bottle thermometer descends slowly, while the outer thermometer remains stationary. This indicates the loss of heat from the bottle. It shows that the water is growing colder.

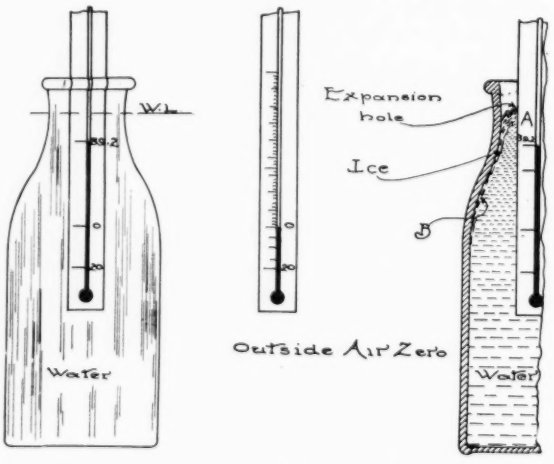


Fig. 2.

A close observer will note that the mercury of bottle thermometer falls steadily till it reaches the 39.2 or 40 degree mark. Then it stays there for some time. An impa-

tient observer might think that it will never go lower, as it stays so long at this point.

While the mercury remains stationary at 39, nothing seems to be going on. The thing may seem a mystery. Outer thermometer zero, inner thermometer 39, and, nothing happening, something seems to be askew.

But no! Nature is performing one of her most wonderful stunts. She is starting in to make ice.

But in doing so she is bringing into action at this time another very important law, one that seems to be a freak, but isn't. It is the law relating to maximum density of water. In all nature, in every country and every clime, water reaches its greatest weight when cooled down to 39.2 degrees F. At this temperature it sinks to the bottom and stays there. If it is cooled more it expands and grows lighter. So we have here that wonderful natural phenomenon of colder water above and warmer water below, both being contained in the same vessel.

This irrevocable law of nature is one of the divine provisions of the Great Architect of the Universe. It makes ponds and lakes freeze over on top instead of at the bottom. If water did not have this point of maximum density above its freezing point, and if ice, which is just frozen water, were really heavier than water, our lakes would become in a terrible condition for navigation. Icebergs would be sticking up from the bottom like rocks, or ice plains like sand shoals. But in His infinite wisdom He created all things perfect. That is why water has its maximum density at 39.2 degrees F. instead of at freezing point. And that is why water freezes on top first, then works down.

If you watch an experimental bottle or bowl, you will observe that for yourself, and you'll never forget it. You will see the water slowly crystalizing into ice on the surface. In the case of a pond or lake, it will usually begin to form where the water is shallow, quiet and clear. If the frost comes on quick and sharp, the shore or bank being yet comparatively warm, the edge along shore may not be frozen, while further out the ice is well started. This is due to the solar heat still existing in the bank. It is flowing from the warm ground to the colder water at the edge,

But the very opposite occurs in a milk bottle, or bowl.

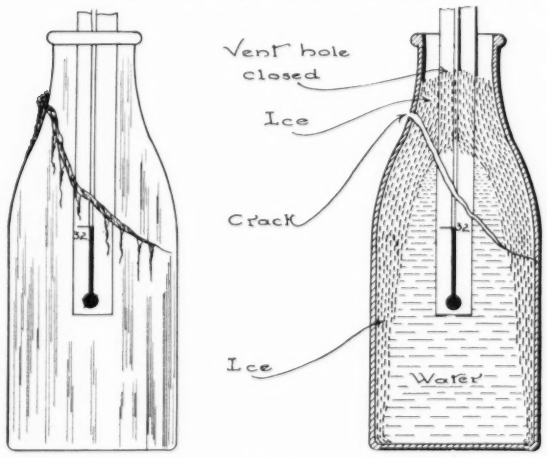


Fig. 3.

The glass is chilled by the outside air. In turn, it chills the water which touches it. Therefore the ice forms around the edge first, working from the glass inward. It does this only because the glass is colder than the water.

Watch the experimental bottle carefully. Observe the ice forming. Note how it freezes from the glass toward the center, something like Fig. 2, and note how a vent hole, or very thin ice at the center of A, allows the expanding water to ooze up. This gives vent to the bottle and so far has prevented it from bursting.

Let the bottle remain in the cold. Let the water continue to freeze undisturbed. You will find that the entire surface of water on top will soon freeze over now. The vent hole will freeze up solid, and the ice which now lines the inner wall of the bottle all around, as at B, is growing thicker. The ice is developing in all directions toward center of bottle, but mostly at or near top of bottle, and working

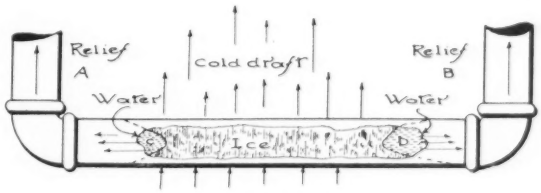


Fig. 4.

downward. Now, the bottle is hermetically sealed. The water has no relief hole. There is no place for it to expand into, and the bottle soon cracks or bursts apart, as in Fig. 3.

This brings us to a very important physical property of water, namely, its incompressibility. You can compress rubber, air and other substances. You can take two cubic feet of air at atmospheric pressure and push it into a space of one cubic foot with a hand pump by increasing its pressure 15 pounds. But you cannot compress water.

Still another important property of water is its expansion when being converted into ice. During this process it expands about one-ninth of its volume. That is to say, 9 cubic inches of water will make 10 cubic inches of ice. That is why ice is lighter than water, and that is why ice floats with about one-ninth of its volume out of the water.

So when we consider these properties, and to them add just two more points, we have the whole theory of vessels being burst while freezing. We have to consider them also in order to complete our chain of study.

The first and more important is another one of nature's wonderful laws. It relates to the transmission of pressure by fluids. It is known in physics as "Pascals'" law, and is as follows:

The pressure of water per unit of area, exerted anywhere on a liquid, is transmitted undiminished in all directions by that liquid, and acts with the same force on all surfaces, in a direction at right angles to those surfaces.

Read that law over again, please. It should be remembered by every plumber, for it is the basis of most hydromechanical problems. No plumber is an educated plumber who does not fully understand that law.

In our milk bottle experiment it operated to burst the bottle. The expansion of the ice working inwards exerted a force on the hermetically sealed water in the bottle. But according to Pascals' law the pressure was transmitted by the water equally all inside the bottle.

This now brings us to the last link in our chain, the actual bursting of the bottle.

The reason, why the bottle burst, is only because it could not stretch itself to allow for the irresistible expansion of the water. A glass bottle is not strong enough to resist it. No iron or steel vessel of commerce is strong enough to resist the expansion of water. If the bottle had been made of rubber instead of glass, so it could stretch, it would not burst. But it wasn't, so it just burst.

This, then, finishes the theory of production of ice, and how non-elastic vessels containing the ice are burst by it.

Let us now see how the theory applies in plumbing practice, and try if possible to find out why some pipes freeze and burst, while others freeze and do not burst.

That seems to be a mystery to some plumbers. But it has a cause. The cause may be hidden from the ordinary eye in some cases. But it is there just the same. There never was an effect without a cause. When anything happens, something did it. It's that something we will look for now.

Fig. 4 shows a pipe that is frozen solid in the middle, but has not burst and will not burst. The conditions here are

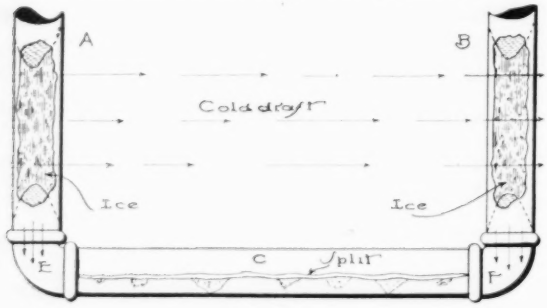


Fig. 5.

favorable to the whole pipe freezing from A to B without being burst. The coldest draft or air around the pipe is in the middle. The pipe freezes here first. Ice forms at this coldest spot while water remains in pipes A and B. And incidentally pipes A and B have reliefs of some kind at their ends. These may be open ends, air chambers or anything that will let the water expand back in them.

The ice forms against the inner surface of pipe. It increases in thickness till it meets in center. Then pipe is frozen solid as shown. But in the formation of the ice the expansion is principally communicated away from the ice in opposite directions, as shown by arrows at C and D, the water beng pushed up pipes A and B to the relief points, wherever they happen to be.

So long as the pipe continues to freeze both ways from this coldest starting point, and so long as the reliefs are able to take care of the expansion, this line of pipe wil not burst.

But let the expansion be blocked, say by another freeze somewhere else in pipes A or B, then that pipe will be burst at its weakest spot. This weakest spot may be at the place where the ice is formed, or it may not. Wherever it is, it will give out and furnish the necessary relief, which the condition demands.

This is made more clear by a study of Fig. 5. Here we find a pipe that will burst, because the genuine bursting conditions are present.

Cold wind blows horizontally across the two pipes A and B, which are full of water. These pipes freeze where

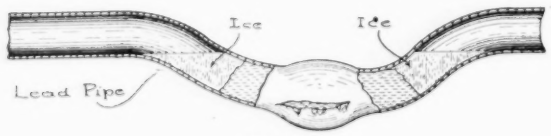


Fig. 6.

this draft strikes them. The pipe C is not in the direct line of the draft and therefore does not freeze as quickly as A and B.

Ice forms solid in A and B. Expansive forces are exerted in both directions by these growing ice plugs. Those exerted downwards, at E and F, are transmitted to pipe C, which, being weaker than the elbows, just splits open at its seam as shown. This lets the surplus water out. But the pipe is burst.

Every plumber, particularly every country plumber, is familiar with the form of burst shown in Fig. 6. It represents a sag in a lead pipe. It is burst by two ice plugs which developed above the hole, and pushed downwards the same as previously described for Fig. 5. Such a leak often happens at the back of laundry tubs.

For instance, the owner of a country home has his hired man turn off the water and empty the pipes for the winter, He does so; but not being aware of the trapped pipes back of laundry tubs, he leaves the trapped portions full of water.

Cold weather comes along. Ice plugs are formed as in Fig. 6. They work down toward center, compressing the un-frozen water between the plugs. In the meantime the lead pipe stretches and takes care of it. But one certain spot in that lead pipe is weaker than the rest. It yields to the great pressure, and allows the surplus water to get out. But it has burst, and perhaps there was not more than half a pint of water in the pipe altogether.

This shows that the amount of water in a pipe has but little to do with its being burst by frost.

The examples given not only show how some pipes will freeze, and other pipes not freeze, but they also show how plumbers must be careful in selecting locations for water pipes. They must be run where they will not freeze.

When service pipes are run under ground they must positively be safely below the greatest frost line of the vicinity.

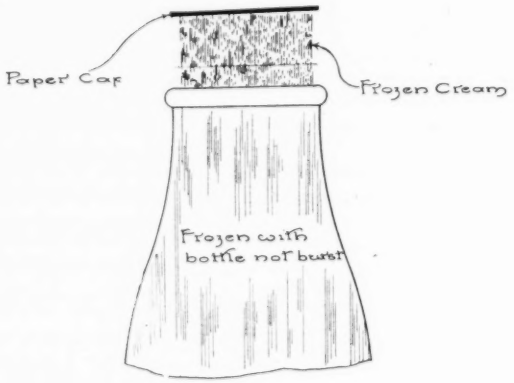


Fig. 7.

When water pipes, either hot or cold, are run in cellars, they should not be near the outer walls, because cellar windows are frequently left open during the winter by mistake, and pipes in the direct line of the cold draft are liable to freeze.

When water pipes have to be run near cellar wall-heads, care should be taken to plaster up every little crevice at sill, or elsewhere, that might allow cold drafts to blow against the pipes.

And, above all, care should be taken to avoid running water pipes up inside cold outside framed walls, particularly at the north side of a building, or they will surely freeze some time.

Perhaps some married men, who have the good habit of taking in the milk bottles every cold morning for their wives, may remark: "But how do you account of some milk bottles freezing and bursting, while others freeze and don't burst?" To these brother benedicts I will say that I have had the same habit myself.

I have seen our milk bottles so severely frozen that the cream was pushed up out of the neck of the bottles, like Fig. 7. This is explainable, probably, only by the difference between the viscosity of cream ice and that of water ice. Water ice is hard, firm and strong. Cream ice is soft,

(Continued on Page 425.)

The Flow of Steam and Vapor

Errors and Obstructions Which Reduce Efficiency in a Heating System

By ALFRED G. KING

A SYSTEM of heating that apparently works perfectly, that is, without noise or trouble of any kind, is apt to be looked upon as being as near to perfection as it is possible to make it. Any person, who is thoroughly conversant with the various systems of heating now in use, and who is familiar with the possibilities (and also the limitations) of those systems, will say, we believe, without any hesitancy whatever, that the goal of perfection in a heating apparatus is yet to be reached.

In planning and installing work of this character there are so many conditions to be met, and so many details to be mastered, that it is nothing short of a wonder that so many heating plants perform really satisfactory service. Failures are not always due to faulty work on the part of the steam fitter. The engineer or designer of the apparatus may have made an error in calculation, which, if followed to the logical conclusion, may mean that the system of piping is not properly proportioned, or that the radiating surface or size of boiler installed is too small for the work.

The fact is that every heating system is made up of many units which, in a perfect system, must work together harmoniously, each performing at the proper time the function for which it is installed.

It is with this thought in mind that we desire to call attention to many causes of failure—or the partial failure—of various systems to give satisfactory results.

The common faults to be found are: Too small or badly designed piping; too little radiation, often not properly placed or connected; too small a boiler to produce the required amount of steam or vapor; or a poorly constructed or badly designed chimney—often insufficient in area or height. To the competent heating man these errors all present symptoms, which assist him to quickly diagnose and cure the trouble.

Quite frequently there are small faults to be found in the average installation, which are not sufficiently serious to prevent the system from producing the required amount of heat. However, if such faults are corrected it will give better results with less labor of attendance and with a very considerable saving in the consumption of fuel. Obstructions to the flow of steam or vapor as found in many installations would lead one to the belief that the designer of the system, or the heating contractor, who installed it, was either very careless or ignorant of the requirements.

The common one-pipe, low-pressure gravity steam system is doubtless the most familiar and simple of all steam heating methods now in use. The high point of the piping is immediately above the boiler and it is customary to grade the main downward from the boiler to the end of it, at which point the pipe is reduced in size and brought back to the boiler as a dry return, or it may be dropped below the water line and returned to the boiler as a wet return. It is usual to make a circuit with the main around the basement of the building to be heated, keeping it two to four, or possibly five feet, from the outer wall. The branch connection from the main to a radiator or riser is made with a single pipe pitching upward from the main to the radiator or riser connection. The method of taking the branch from the main is one of the first details to be observed. The condensation from the radiator returns through the same branch that supplies it with steam and if the connection is made with a nipple and 90-degree elbow the returning condensation flows into the main on top of the steam, saturating it and reducing its value. If a 45-degree elbow, and connection, is used the condensation returning along the bottom of the branch flows down the side of the main joining the water in the bottom of it, thus keeping the steam as dry as possible. We have had occasion, several times, to illustrate and comment on this fact, but the fault is so frequent that we again call attention to it. Fig. 1 illustrates the first condition, showing the condensation saturating the steam, and Fig. 2, the method of avoiding this by using a 45-degree connection. It is estimated that a main will do 25 per cent more work when 45-degree connections are employed. The 90-degree style of connection has been handed down from the period when two-pipe work was in vogue and should not be used except on work where separate return branches are provided.

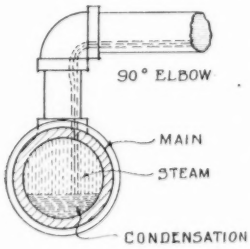


Fig. 1.

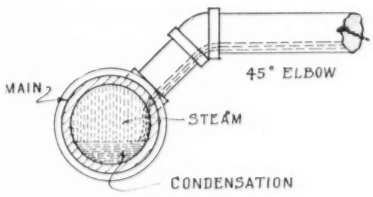


Fig. 2.

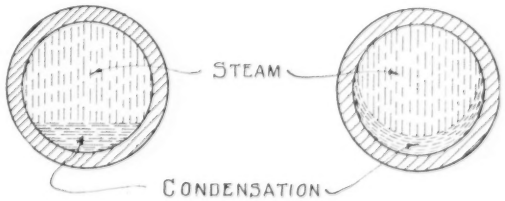


Fig. 3.

The main—as to area—of a low-pressure steam system has been the subject of much discussion. On a one-pipe circuit system it is desirable that the pressure at the end of the main be kept as nearly equal to boiler pressure as possible. Pressure of steam in a main is decreased by condensation and by friction, therefore any plan or method that can be employed to prevent condensation and lessen friction will add to the service obtained from it.

The condensation is largely prevented by covering the main with good pipe covering. The friction in it is con-

siderably reduced by an increase in size or area so that a larger volume of steam at less pressure and with less friction may flow through it to the end. By this statement we mean that an initial pressure at the boiler of ounces instead of pounds will be sufficient to fill the system with steam or vapor. If asked to name the most important feature of a good low-pressure steam system we should say: Ability to fill the system with steam when boiler pressure is one-half pound (gauge pressure) with a velocity sufficiently low to ensure a pressure drop of not more than two ounces at the end of the main.

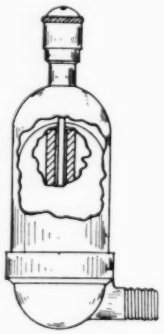


Fig. 4.

High velocity in a horizontal steam pipe (main or branch) not only increases the friction but also helps the condensation to wet or saturate the steam. Fig. 3 illustrates a cross section of a pipe, showing the position occupied by the steam and water when passing through it at a low velocity and a cross section of the same pipe showing the steam passing through it at a high velocity. Note that in the latter case the water of condensation does not remain at the bottom of the pipe, but is forced to the sides by the velocity of the steam and indicates how the steam is more or less saturated by the water. Without doubt any increase in velocity means a decrease in efficiency.

The main is the steam reservoir supplying all radiators,

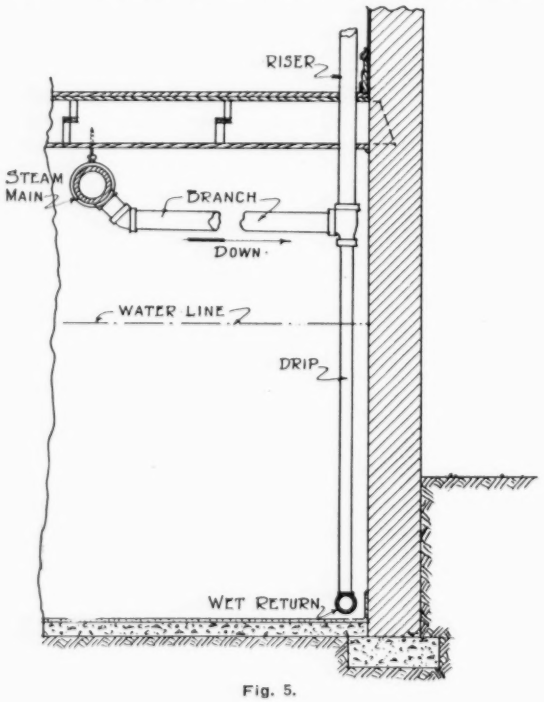


Fig. 5.

and it should fill with steam or vapor quickly, but should it be full of air, it cannot fill with steam until the air has been exhausted or driven out. For this reason the ends of all steam mains should be properly vented. We say "properly" vented for the reason that it is common practice with many heating men to use a common automatic air valve on a main, this valve having a small air port about the diameter of a pin. Fig. 4 illustrates an air valve of this type, which all will recognize. We have seen hundreds of jobs ranging in size from a few hundred feet to several thousand feet of radiation supplied, or from a 2-inch to a 6-inch main, with no other vent than that illustrated by Fig. 4.

As an example of the above condition, consider the cubical contents or volume of air in 200 lineal feet of 4-inch main (an average sized job) being exhausted through an

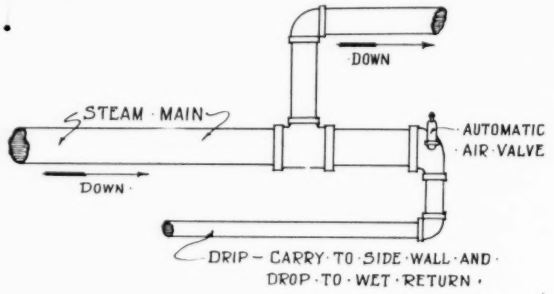


Fig. 6.

opening the size of a pin hole and it is easy to understand how slow this process must be.

The end of a heating main should be provided with a special size of automatic air valve having an air port of ⅛-inch or ¼-inch, according to the size of the installation. The air will then be quickly expelled, allowing the main to fill with steam to the end of it, with the result that all of the radiators connected will receive a supply of steam at practically the same time. Several makes or varieties of air valves for this special purpose are to be had.

To further increase the efficient service of the main it is well, when possible, to relieve it of accumulated condensation at one or two points. There are many installations requiring mains of exceptional length, on which it is possible to run a small wet return at least a portion of the length of the building, and when this can be accomplished there are several available methods of draining the main. Fig. 5 illustrates a method of draining through a dripped riser connection. The branch, in this instance, is taken from the bottom of the main with a 45-degree connection and should pitch slightly downward to the

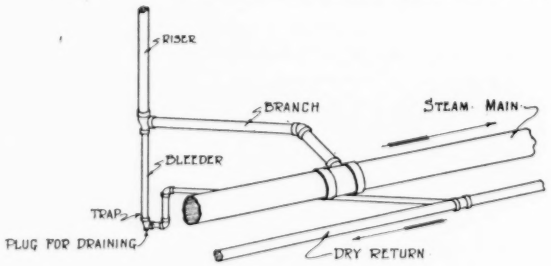


Fig. 7.

riser connection. A 90-degree connection may be used if desired, although the 45-degree connection will save some little head room. The drip or bleeder should be sufficiently large to care for the condensation from the radiation connected or supplied by the branch, as well as the condensation that has accumulated in the main. For the same reason the branch should be one full pipe size larger than the riser which it supplies.

A second method is shown by Fig. 6. In this instance the main is relayed or raised to a higher level, the grip being independent of a branch or riser. Note that the main is carried full size slightly beyond the point where

(Continued on Page 424.)

QUESTIONS & ANSWERS

HOW TO CACULATE THE FORCE OF THE SHOCK OF A HYDRAULIC RAM.

Editor "Domestic Engineering":—I have a question, which is perhaps out of the ordinary run of questions asked you, but nevertheless one which I would like very much to have answered. It has to do with the operation of an hydraulic ram. Fig. 1 shows a line of 1-inch pipe, approximately 60 feet long, with a vertical drop of 7 feet, the line running at an even grade. The water enters the pipe in a reservoir at the top with the pipe submerged about three inches under water level. The question is: What is the force per square inch applied to the flutter valve of the ram each time it is closed?

Fig. 1.

As you know, the valve closes suddenly and therefore the moving column of water is stopped instantly.

As I figure it, the velocity of the water is five feet per second, and the weight of the water to be stopped is 20½ pounds.

Marysville, Kan. N. A.

This problem resolves itself into the force of a blow or rather momentum, the weight and velocity of the hammering medium being known.

In this case the weight of water in pipe is estimated to be 20½ pounds which we will assume to be correct. The velocity is estimated to be 5 feet per second, which we will also assume to be correct. At any rate it is immaterial, as the principal thing to know is the formula for finding the force of a blow not only in this specific case, but also in other cases that may arise in practice. The formula is:

$$\text{Force} = \frac{\text{velocity} \times \text{mass}}{\text{time}}$$

Explaining this formula, force is that force or unit of force, which in one second will give to unit mass a velocity of one foot per second. Mass is considered to be an expression of the weight in pounds.

Substituting, then, and using the figures specified, we have:

$$\text{Force} = \frac{5 \times 20 - 5}{\text{time}}$$

Now the question of time comes up. This is the time required to overcome the momentum by an opposing force. The velocity of the blow, or driving water being in seconds the time required to stop it is also in seconds. Suppose it is one second. Then the answer would be $\frac{5 \times 20 - 5}{1} = 102.5$ pounds. If time was one-tenth second, force would be 10.25 pounds. Or if time was 5 seconds force would be 20.5 pounds.

Of course this is theory. Lots of unknown factors enter into the practical problems of driving rams, such as deduction for time required to close main valve, and snifter valve, any air that may have accumulated under check valve from snifter, etc. Manufacturers in cases of this kind usually determine these things by actual tests with special instruments.

HOW TO HEAT RANGE BOILER AND WALL COIL FROM KITCHEN HEATER.

Editor "Domestic Engineering":—Please tell me what would be the best way to make a coil heat, if connected to range boiler as shown in Fig. 1.

Waterloo, Iowa. H. P. J.

By the arrangement, shown in Fig. 1, correspondent will be able to heat the range boiler. The coil cannot be properly heated by this plan. It will not receive any heat until boiler is heated all the way down to the bottom. Even then the heating results will be irregular and no doubt unsatisfactory because when hot water is drawn at fixtures the cold water running into bottom of boiler from inner tube will quickly find its way into the coil and cool it off.

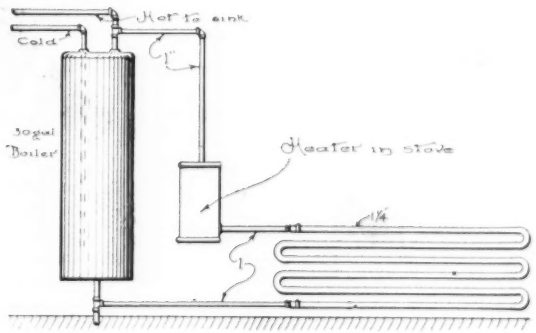


Fig. 1.

It is evident that the arrangement has two grave faults, if the coil is an important factor. First, it is secondary to the boiler, receiving only surplus heat after boiler is heated; second, it will chill off every time a few gallons of hot water are drawn from boiler.

The boiler is really the favored element of the combination, and if this is intended, then the general arrangement is probably as good as can be designed.

But if it is desired to favor the coil, allowing surplus heat from coil to flow to boiler, then the layout should be changed.

Fig. 2 is a suggestion as to how it may be done. The coil is raised above level of heater being connected to flow pipe from top of heater.

A three-way, round-way full bore ground key cock lubricated with graphite, is attached at A to divert the hot water ascending from heater either into coil or direct to boiler as desired. During summer this cock handle would be turned so that all the hot water would go to boiler. If a little heat is desired in coil, say during

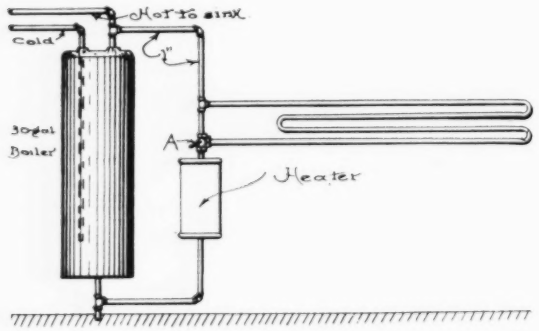


Fig. 2.

moderately cold weather, the cock would be partly open to coil and partly to boiler. During very cold weather, or when boiler is too hot, the cock may be open full to coil. In this last position the coil will cool the water materially as it flows from heater to boiler.

It is true that the location of the coil in Fig. 2 is not as good as that in Fig. 1, as far as keeping the floor warm is concerned, but the advantages secured by having it above the heater, we believe, in most cases more than make up for it.

Plumbers do not, as a rule, like to place valves on hot water circulating pipes at heaters, but in this particular case we are sure the three-way cock is not a dangerous element. On the contrary it is an element of great convenience, allowing the owner to switch the heat either to coil or boiler, as he sees fit, and without any danger whatever.

AIR BINDING OF HOUSE DRAIN TO SEPTIC TANK.

Editor "Domestic Engineering":—Fig. 1 shows the main drain trap in the cellar of a building here, connected up to an air-tight septic tank by 6-inch salt-glazed earthen

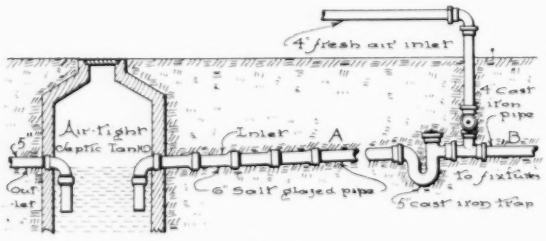


Fig. 1.

pipe underground and a 6-inch elbow turned down under water in septic tank.

Please note that the 5-inch house trap seals upper end of house sewer, and the bend at septic tank seals the lower end. There are no branches entering the house sewer and no vents taken from it.

I claim this arrangement will get air bound in time between cast iron trap and septic tank. What is your opinion?

Methuen, Mass. W. S.

We thoroughly agree with W. S. The house sewer A is air bound, theoretically. Whether it is air bound practically or not depends upon the tightness of the joints in the earthen pipe. These may be tight or they may not.

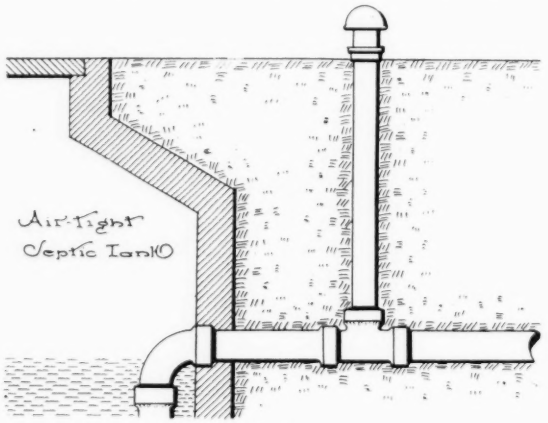


Fig. 2.

In any case they are intended to be tight. So in an argument they should be assumed to be, as they were intended to be. Being tight it is self-evident that the pipe air is air bound. And, being air bound, it cannot be called good practice.

If pipe A is air tight and air bound, then it is also evident that the sewage, which flows down house drain B will not freely flow through trap, but will back up in house drain. It will of course slowly seep through trap to sewer, but in doing so, it leaves solids behind which accumulate in bottom of drain B. Such a condition of affairs is not in accordance with modern ideas of sanitation. It should be avoided in all good work.

The remedy is exceedingly simple and very inexpensive. It means venting the sewer A at some convenient place.

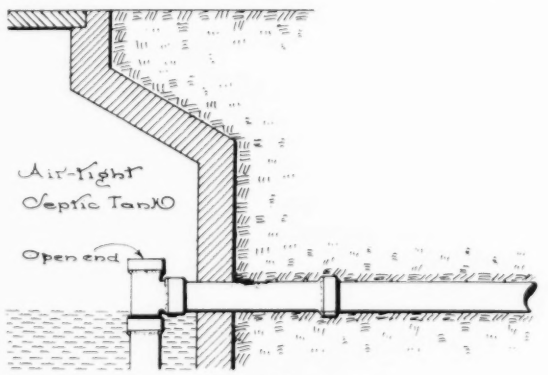


Fig. 3.

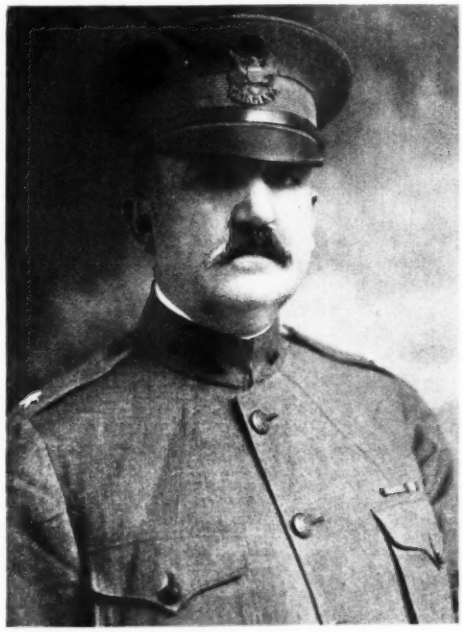
A capped vent may be run above ground, as shown in Fig. 2. Or the elbows at septic tank inlet may be substituted with a tee as in Fig. 3. The vent cap plan is undoubtedly the best.

Regarding the tee plan shown in Fig. 3, the tee is

(Continued on Page 423.)

Sidelights on Men in the Trade

A Gentleman of Virginia



WHEN a man affirms, in these stormy days of Teutonic intrigue and pro-German propaganda, that he is an American in spirit as well as in name, we are prone to believe that he is indeed a patriot upon whom the nation can look to for aid and moral support.

But when a man can show that he is not only an American, but a Virginian as well, we feel that here is a type of citizen, who is ready and willing to sacrifice his life, if need be, in order that he might uphold those sacred principles and traditions, which gave birth to the greatest modern form of representative government.

The American who is born and bred in Virginia, the home of the Colonial cavalier and the birth place of our traditional chivalry, is doubtless the kind of patriot who, with Commodore Stephen Decatur, will say: "Our country! In her intercourse with foreign nations may she always be in the right; but our country, right or wrong."

It is this unimpeachable attitude which animates the loyal American whether he resides south or north of the Mason and Dixon Line. He stands unswerved in his patriotism in spite of the sophistry and hair-splitting arguments, which have been advanced on behalf of German Kultur—the modern world menace.

Millions of Americans, animated by the Decatur spirit, are preparing to stand back of the Stars and Stripes in the world's effort to humble the vaunting egotism of Prussian autocracy. There is no longer any sectional animosity. The wounds of the Civil War have healed completely. The sons of the men, who wore the blue and the gray, are all united in khaki and marching under the banner of freedom and democracy.

From the State of Virginia, the home and birth place of Robert E. Lee, the leader of the Confederate armies, the troop trains are carrying to southern cantonments thousands of staunch Americans, firm in their ambition to add new luster to the flag and to the traditions of the South and of Virginia.

Among these brave Virginians, some of them sons of the men who fought with Lee in '61, we find a gentleman, well known among men in the heating trade. We find him dressed in khaki and with all the responsibilities of a commander—we refer to Brigadier-General C. C. Vaughan, commander of the Virginia State troops and president of the Lytton Manufacturing Corporation, of Franklin, Va., a large concern making specialties for the heating trade.

General Vaughan is a type of American, who will help to perpetuate the glory of America's valor upon the field of battle. He comes of genuine soldier stock, his father, the Hon. C. C. Vaughan, serving throughout the Civil War with an enviable record for gallantry and bravery. His great-grandfather was a soldier in the war of 1812, and his great-great-grandfather a soldier in the American revolution. The last of the Vaughan generation, Cecil C. Vaughan III, son of the general, is a first lieutenant of Virginia troops.

General Vaughan's manly qualities and his reputation for making friends are unsurpassed. In his business and social relation, the charm of his sterling personality has made itself felt and his square deal policies with customers has been a factor in the rise and development of the corporation he now heads.

He was born in the city of Franklin, Va., on July 8, 1868, just three years after the close of the Civil War. His connection with the Virginia State Militia dates back to 1892, and every rank, he has held in the service from a second lieutenancy down to the present time, has seen his constant application, bending every energy for the good of the service. His excellent military record, combined with his well known business ability and personal popularity, have served to make his rise to the highest military command in the state, a matter of special gratification to his friends in the army as well as those in his native city and throughout the country.

He became a captain in the state militia on March 2, 1897, serving in that capacity during the Spanish-American War, from April 25, 1898, until the mustering out of the troops in April, 1899. Upon the reorganization of the old Fourth Virginia Regiment after the Spanish-American War, he was again made a captain, and at the organization of the Seventy-first Regiment of Infantry, he was elected lieutenant-colonel, and was unanimously elected colonel of the regiment on February 19, 1906, after the death of Colonel A. M. Higgins. Just one year afterwards, on February 16, 1907, he was chosen by the officers of the three Virginia regiments, now known as the First, Second and Fourth, to be brigadier-general of the Virginia Volunteers.

Sharing the view of other men in the heating trade, who have entered Uncle Sam's service, General Vaughan is convinced that America must win the war. There is no other alternative. To permit the Prussian autocratic ideal to triumph, and become a dominating factor in civilization, would sound the death-knell of the future hopes of progressive democracy. Men of General Vaughan's type of patriotism will exert every possible effort to effectually crush the wild imperialistic design of Kaiser Wilhelm.

Raymore & Company—Plumbing and Heating Supplies

By DANIEL LOUIS HANSON

PHIL HARTON knew it was gout, though the boss insisted it was nothing more than mere rheumatism in his big toe. Had it been in the golden days, previous to August, 1914, the boss would have been proud to confess to a case of gout, but gout was no longer good form in England, hence the boss diagnosed it plain American rheumatism, "location, the big toe of the right foot."

At any rate, the boss had been compelled to cut short that series of trips around the city, which had marked him as the Haroun al Raschid of the plumbing and heating fraternity, being under the necessity of confining himself through personal observation to what could be seen of life from his windows—Mulberry Bend Park, the ragged vista of dismantled structures, marking the new civic center to the south, and the fine towers of the Municipal Building at Chambers Street. For information outside of this rather circumscribed area he was indebted to Phil Harton, who had begun to look upon himself as the relater of "The Thousand and One True Episodes in Plumbing Circles," each day witnessing a demand from the boss for at least one tale. Fortunately the sales manager had a goodly number at his disposal and had much profit as his compensation in the trite comments from the boss, covering the various business complications and situations he related.

Oftentimes the story for the day grew out of some remark made by Mr. Raymore, so it was on this occasion. The boss had just laid down the last of the five morning papers, which formed his daily stunt, and looked up with a "Good morning, Phil. How are orders?"

"Seventy-nine so far, Mr. Raymore, and the second mail has just come in; it's a heavy one, too."

The boss looked pleased for only a fleeting moment, then his face took on one of those spasmatic grimaces, which indicated to observant Harton that Mr. Raymore's big toe was in juxtaposition—at least nervously, with the portiere whiskers. So the boss thought too; evidently, for he gave a vigorous bell-rope pull at both of them.

"Don't ever acquire rheumatism, at least not in your big toe," he cautioned his sales manager.

"As long as I am sales manager and the sea routes to Europe are closed, there is no danger of my being taken that way—at least, if it isn't contagious," and Harton put on a look of apprehension.

The boss picked up "The Times" again. "I see that the Commodore Hotel is being pushed along as rapidly as the labor unions will permit," and he expressed some opinions of labor which will be censored. "Well, that's the last of the big hotels—the last."

"But why the last?" queried Harton. "There is nothing new invented that's going to take the place of hotels with the traveling public. Or will the widened Erie Canal permit people to go right through to Chicago without stopping in New York City?"

This last was a thrust, for the boss, who knew every European city, also those of South America and Asia as well as his New York, had never been in Chicago except one night and that he had spent in a side-tracked sleeper. The boss knew every paving stone of the short and far from inspiring Boul' Mich' in Paris, but the glorious vista and the temples of that other, but much longer and far nobler Boul' Mich,' which skirts Lake Michigan, he knew not.

But the boss ignored Harton's thrust. It wasn't quite fair at that, for he was handicapped by that swathed foot and couldn't literally kick the facetious sales manager out of his office, so he replied quite meekly: "There will be no more hotels built in New York City—that is, real hotels—because the war has cut off our available supply of chefs. You must know that no sane individual or syndicate would be so stupid as to even get out preliminary plans for a monumental hotel unless it had a great chef under contract. It is a case of building the structure around the man, and not of finding the man after the building is financed and under way."

"But who does the finding?" asked Harton.

"Oftentimes an enterprising architect; occasionally a firm of builders; in one case I know of, The Valdalloid, the chef himself went out and worked up the deal—that is, he dug out a firm of builders and told them what he wanted, or else he was going back to Paris. They hustled around and got Francois his hotel. Then at times a real estate corporation has a bit of land either for sale or to lease."

"What about material men why don't they get next to the scheme of working up deals?" suggested Harton.

"Possibly because no one of them has enough share in the stuff that goes in. Masonry is only one item, lumber another, steel a third, plumbing still another, and so on. Labor is the biggest one item, so the contractor who has that to furnish has the most at stake."

"Then we supply men in plumbing and heating are hardly in position to go out and work up such deals—I am not thinking of hotels, but other structures, such as flat buildings, lofts, individual residences, and so on?"

"Hardly, but in the classes you mention, especially that of flats and residences, the master plumber and heating man would have a legitimate field." The boss looked out at Mulberry Bend Park and ruminated a moment. "I wonder why that has not occurred to some of our customers. They sit around and complain of dull business, find fault if it doesn't walk in the door and kick them into prosperity. Why don't they go out and create it?"

"They do, at least I know of several who do that very thing, on a smaller scale than $5,000,000 hotels of course, yet they work up business where none would have been, had it not been for them. Especially is that true of Jasper Harwood."

"Guess you had better tell me about Jasper Harwood," suggested the boss, getting his rheumatic big toe into the proper listening attitude, "that is, if you can spare the time."

* * *

Jasper Harwood started in business a generation ago, in what was then New York City's best goat pasture—

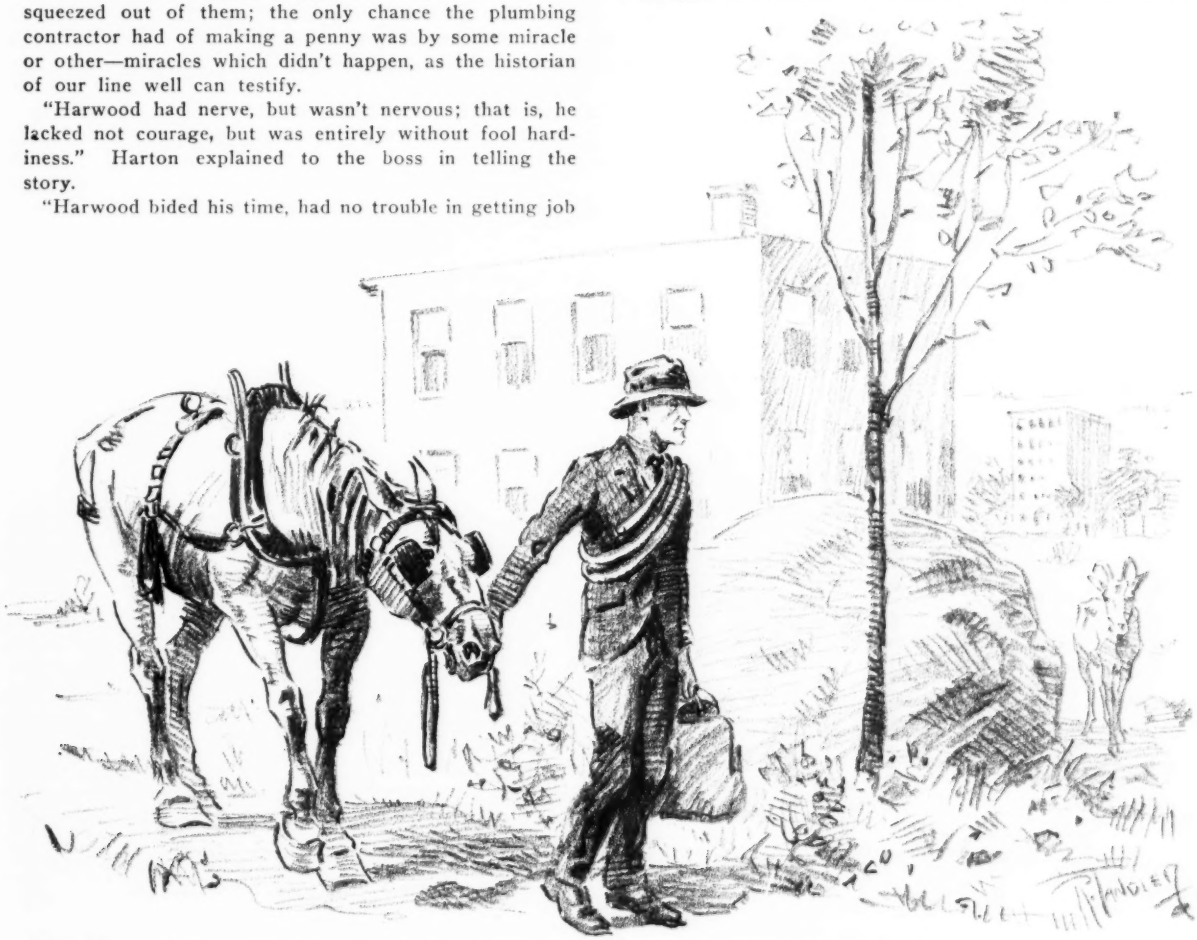
now and for twenty years past, lined along it various aristocratic avenues with palaces and temples. He saw the future of that section, did the astute young plumber and ventured his all, something like $75, an ancient horse, a kit of tools and three coils of lead pipe, he had taken from his last boss in the lieu of wages—in the bright and shining hope of building up a repair business. The new jobs, which before long began to spring up all around him, he couldn't handle, they ran into the tens of thousands each. Besides most of them were peddled around Greater New York, till every trace of profit had been squeezed out of them; the only chance the plumbing contractor had of making a penny was by some miracle or other—miracles which didn't happen, as the historian of our line well can testify.

"Harwood had nerve, but wasn't nervous; that is, he lacked not courage, but was entirely without fool hardiness." Harton explained to the boss in telling the story.

"Harwood bided his time, had no trouble in getting job work, in fact, it was only a question of a short time before he was overun with it, the get-rich-quick contractors having evidently 'wished' some of the fixtures into place instead of installing them. Harwood made money in doing the work over. All the time, however, he was learning men, methods and material, the three requisites every successful master plumber must have."

"He knew his engine, how to steer the car and had good gasoline," was the way the boss commented on Harton's description of the apprenticeship of Jasper Harwood, *after* he became a master plumber.

"But Harwood had one other qualification, that of ambition. Possibly Mr. Raymore might have compared that to the accelerator of the modern motor; without it there would have been no impulse towards greater results. Harwood became possessed of a desire to do new jobs on his own initiative, not simply patch up other (and poorer mechanics) men's work. Some one has said, that the creative spirit marks the genius from the fool. At any rate in the case of Jasper Harwood it became the means of his eventually passing from the ranks of 'repair plumbers' to those of 'contracting plumbers.' However, the young man, he still was young, though some years had passed since that decrepit horse and three coils of lead pipe period—was too shrewd to enlist in the 'competitive' class; he had the common sense to insist that each job should show a profit; that advertising through unprofitable jobs wasn't exactly advertising, but a case of crawling into a hole and then, wood chuck like, pulling it in after him. From that clear conception of what he was sure he wouldn't do, it was simply a matter of planning how to get into the contracting line and still make money.



"He saw the Future of that Section, did the Astute Young Plumber, and ventured his All, Something like Seventy-five Dollars, an Ancient Horse, a Kit of Tools and Three Coils of Lead Pipe."

"You see he had made money right along, but he wanted to earn some other compensation at the same time," explained Harton.

"He wanted to get from the cobbler's low-legged bench to running a custom shop," assented the boss.

"Now not far from his shop there still remained a bit of the old goat pasture, on which was not a palace, but a hovel. It was an odd-shaped bit of land not suitable

for either flat or residence, triangular in form and not over large. At first it impressed Harwood as being suitable for a plumbing shop, it having three streets around it—therefore get-at-able from all sides. Later, it must be understood that the evolution of Jasper Harwood was somewhat drawn out, as are all genuine evolutions, Harwood began to think of more stories to this triangular structure than the floor needed by himself. Yet they would have to be for other purposes than flats. Still, he couldn't really have professional offices such as physicians, dentists and so on over a plumbing shop, they really requiring a drug store under them to seem in real good vicinage.

"Then came the inspiration, born of hard thought, as all real inspirations are. From it grew the Contractors' Building, which to this day occupies that strategic location. But there still remained the land to secure and the building to erect, and in such matters, renting and financing, Harwood was a novice—at least, he so felt himself. He didn't really understand, till he began his efforts along those lines, how eagerly the world of capital welcomes the man with ideas and with nerve. It wasn't so hard after all to get a lease on that crippled piece of property. He had all the time thought of purchase, and to get money on his lease and on the rents, which were ahead, for the building. The idea of a structure for branch offices for down-town contractors in a section, where so many of them had a lot of work and where it promised many years ahead, took like any new and good idea takes the world over, but especially in a big city like New York.

"So before he really knew, he was fairly started. Harwood was the president of the Contractors' Building, and the structure was going up to the full height of its eleven stories," said Harton. "Of course, a man shrewd enough to intiate a scheme like that was not fool enough to let the plumbing and heating of the new structure get away from him; nor the profits such jobs should bring."

From then on Harwood was a contracting plumber, also heating man, he went into scheme after scheme with other contractors, such as masons, steel erection and so on, discovering new locations, getting this or that bank or man of wealth to finance the various propositions and making good on all of them, for each and every proposition, land or building, always revolved throughout the entire transaction around the plumbing and heating jobs.

If it was a vacant piece of land all covered with tin cans and scrub oak, or else one on which an unprofitable structure stood, it was the plumbing fixtures and the heating system that would eventually be installed there that Harwood saw. He built structures around the fixtures and is today a wealthy man.

"The trade should do more of that," commented the boss. "Every town, however, small or large, offers a field. I must go and see Harwood when I get over this accursed rheumatism. By the way, I wonder how the Czar is fixed for plumbing and heating fixtures in that flat of his out there in Tobolsk? He was a pretty decent sort of fellow, though somewhat of a mollycoddle. If I knew they would get there, I might send out a few fixtures."

"Better send them to Camp Devens up in Massachusetts, and by motor truck at that," was Harton's good advice.

"The man with the vision is bound to succeed," said the boss as Harton rose to go, after having told the story of Jasper Harwood, "and the way to get vision is to train oneself into the receptive mood. To make a chart of one's achievements to date, then see in comparison how little the sum total is, as measured by the results gotten by other men. The man who looks into the mirror continually while driving his car, had better put the speed lever into reserve to begin with."

December 11, 1917.—Special meeting of the Sanitary Potters' Association, at the Hotel Astor, in New York City.

December 11, 12 and 13, 1917.—The annual meeting of the National Association of Brass Manufacturers, in New York City, with headquarters at the Hotel Astor.

December 12, 1917.—Meeting of Chairmen of War Service Committees of All Industries, in Washington, D. C.

January 15, 16 and 17, 1918.—The annual convention of the Iowa State Association of Master Plumbers, at Waterloo, Iowa.

January 22, 23 and 24, 1918.—The twenty-sixth annual convention of the Illinois Master Plumbers' Association, in the Sweeting Building, Bloomington, Ill.

February 5, 6 and 7, 1918.—The annual convention of the Ohio State Association of Master Plumbers, at Dayton, Ohio.

PLEASE DON'T FOLLOW THESE SUGGESTIONS!

Ten Ways to Kill an Association.

1. Don't come to the meetings.
2. But if you do come, come late.
3. If the weather doesn't suit you, don't think of coming.
4. If you do attend a meeting, find fault with the work of the officers and other members.
5. Never accept an office, as it is easier to criticize than to do things.
6. Nevertheless, get sore if you are not appointed on a committee, but if you are, do not attend the committee meetings.
7. If asked by the chairman to give your opinion regarding some important matter tell him you have nothing to say. After the meeting tell every one how things ought to be done.
8. Do nothing more than is absolutely necessary, but when other members roll up their sleeves and willingly, unselfishly use their ability to help matters along, howl that the association is run by a clique.
9. Hold back your dues as long as possible, or don't pay at all.
10. Don't bother about getting new members. "Let George do it!"—The Milwaukee Builders' Bulletin.

The Joke Recoiled.

Riggs (facetiously)—"This is a picture of my wife's first husband."

Diggs—"Silly-looking guy! But say, I didn't know your wife was married before she met you."

Riggs—"She wasn't. This is a picture of myself when I was twenty-five."—"Boston Transcript."

Short Talks

By W. W. HUGHES

Team Work.

THEY were a strange combination, an old-time, down-East Yankee and a Frenchman, who had worked at the trade side by side for a number of years and finally had cast their lot together and embarked in the plumbing and heating business.

They fought with each other like cat and dog, but back to back they fought the world at large. For a full quarter of a century, this strange business partnership continued on its way. Each partner seemed to travel his own way, and whenever they met, the sparks flew, but notwithstanding this fact, they made money and they saved the money that they made. Perhaps their "scraps" were but a part of a drama, in which they were the two principals, and the world their audience.

And then at last, the expected happened, a dissolution of partnership left one of the two in full control of the business; the other became one of that few and select number, a retired master plumber. Contrary to the general opinion existing in the trade, there are only few of them scattered about the country.

This retired master plumber was in my place of business a short time after the big split, and a salesman, who had called on them for a great many years, was present, and he asked a question which had been in the minds of a number of us. He said: "Harry, what are you going to do now? Open up a shop of your own or stay on the retired list?"

And his reply has lingered in my memory ever since that day and has often been in my thoughts. As nearly as I can recall it, it was about as follows: "George," (this to the salesman, who had asked the question) "it has always been my opinion that the plumbing and heating business is a two-man business; one man to handle the office and store end of the business, doing the buying and a good part of the selling, seeing to it that the men coming into the shop get what they want in the shortest possible time, keeping the stock worked up so that there will be no overstocks of some materials and shortages of others keeping the tools and equipment in first-class, usable condition, answering inquiries on the telephone, so that people calling up will get sensible intelligent answers to their questions instead of hearing that shop-worn chestnut: 'The boss is out and I don't know when he will be back.' And while one man is handling this end of the game, the other fellow will have his hands full, visiting the work in progress, estimating new work, checking up some of the accounts which lag behind, taking out permits, picking up special fittings, fixtures and repair parts at the various supply houses, and in general demonstrate that when we do a job, we give it personal and efficient supervision.

"The application of those two principles resulted in our making money, and with very few exceptions our customers were always repeaters. Some of them would get away at times, but the majority of them came back because we demonstrated that we delivered the goods.

"I don't say that a partnership is an absolute necessity; nor that one man cannot make a success of the business alone, but it is my opinion that a partnership is the best team, the next best is a live master plumber with an efficient manager or foreman. I am out of the game now and I don't know where to get the kind of a partner, manager or foreman that I want, so I am going to rest on my laurels."

This idea is worth thinking over. There are lots and lots of one-man shops scattered from one end of this country to the other that would do well to double up. Two heads are better than one, and one good plumbing and heating establishment is better than two of the one-man type with a slate on the outside of the door.

The doubling up would make for efficiency and economy. There would be a great saving in the amount of the overhead expense. The amount of money invested in the business could be reduced somewhat, depending upon the business involved, while the ability service would be more than doubled.

A Few Minutes at the City Desk.

CONSERVATION is the word of the times, so also are cost accounting and overhead. After working out systems of cost accounting and after arriving at proper overhead costs, the problem confronting the business man is that of applying those costs for the time being, but with the fixed idea of reducing them as much as possible. If, in reducing the overhead, we can also reduce the job cost so much the better.

How many master plumbers have ever figured out how much it costs in dollars and cents to have a journeyman plumber go down to the wholesale house for a few fittings, or a bibb or two, or some other appliance?

I have in mind at this moment the story told me by a helper in this city (Minneapolis). He was helping a journeyman plumber on a fairly large installation, but one in which it was possible to string the work out long enough so that this plumber and helper could handle it alone, although it meant some eight or nine months' work at the very least.

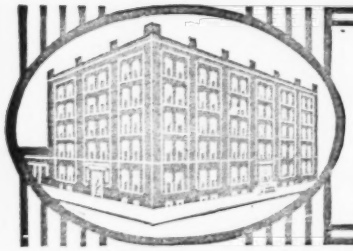
Within a very few days after the work was started there was a shortage of a few fittings that were needed for the work the next day. The helper informed the plumber that he had to come through town and close to the supply house on his way to the job, and could stop off when transferring and get the needed fittings. The plumber directed him to come direct to the job, and further informed him that he would get the fittings.

This program was followed from the beginning to the end of the job and was a regular morning occurrence. To make a bad matter worse, the plumber on his trip to the supply house passed the job on which he was working, and then traveled at least three miles to the supply house and back another three miles to the job, and in the meantime the helper had to pass the supply house to get to the job.

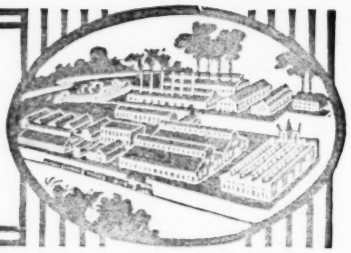
And now to the nub of the whole matter. The plumber would go to the supply house, order his fittings, have a little talk with some of the employes and some of the other men there on similar errands, after which he would head for the job. I have the helper's word for it that some mornings he would manage to get to the job by nine o'clock, but these were the exceptions; the average was close to ten o'clock.

There was an actual loss of time of two hours, or one-fourth of the day's work. With wages at $5.50 per day of eight hours, the loss was $1.37. There were at least 250 working days, making a total loss of $342.50.

(Continued on Page 422.)



Among the Wholesalers and Manufacturers



REMODELING ITS PLANT.

Richmond Foundry & Machine Co., of Richmond, Va., manufacturers of iron plumbing specialties, is remodeling its plant in that city.

OPENS BRANCH AT LOS ANGELES, CAL.

The Ernest Mehring Co., of Chicago, has just opened a branch in the Wilcox Building, at Los Angeles, Cal., from which the company's business in California will be handled. Forest A. Sutphen, of Los Angeles, has been appointed manager of the new branch.

IMPROVING ITS BUSINESS QUARTERS.

Seaboard Supply Co., of Norfolk, Va., is making extensive improvements to its establishment. New show rooms are being equipped in which plumbing fixtures will be shown in operation. Offices are to be located on the second floor. George J. Lee is vice-president and manager of this business.

BUILD LARGE PLANT AT CAMBRIDGE, O.

The Florentine Pottery Co., of Chillicothe, O., manufacturers of vitreous sanitary ware, is building a new plant at Cambridge, O., consisting of a large building, the center part of which is 350 feet long and 65 feet wide, two stories high with two wings, one at each end, 135 feet long and 50 feet wide. The whole structure, including floors and roof is built of reinforced concrete with metal sash and frame, making it entirely fireproof.

ANNUAL CONFERENCE OF THE MANUFACTURERS' AND DEALERS' PROTECTIVE ASSOCIATION.

The Manufacturers' and Dealers' Protective Association held its annual conference and dinner at the McAlpin Hotel in New York City, on Tuesday afternoon, November 27th. President Seymour in opening the business conference invited suggestions for improving the work of the association and urged the members to take advantage of the service which the organization affords.

Secretary Noble reported an increase in membership of thirty-six since April 1st, this year. He also presented a detailed report of the work of the reporting department of the association from May 1, 1906, to May 1, 1917. It was noted with interest that accounts collected for members, during the present year, amounted to $137,480.93.

After a thorough discussion of the detective agency feature of the association's activities, in which the work of the Burns Agency was highly commended by members who had been using the service, it was decided to continue this feature.

F. A. Bucknam, New York manager of the Walworth Manufacturing Co., called attention to a new feature of the estimating evil; that of demand for net prices for each item. This is a new trick, he said, which, unless nipped in the bud, will presently become universal and make an already bad condition worse. The increased labor, attending the making of an estimate of that kind is ten-fold, he said, and from the standpoint of labor conservation, here is a good place for the jobber to begin to help the government. He called upon the jobbers to refuse absolutely to tolerate such abuse and thereby not only check a growing evil, but lay the foundation upon which they can make a stand for the eventual elimination of the estimating evil entirely.

Mr. Bucknam's remarks were met with the applause of the members, several of whom individually endorsed his plan and further commented on the matter.

L. O. Koven, of L. O. Koven & Bro., made the closing talk of the session, urging the members to take advantage of the facilities offered by the association and use the service of the several departments.

PROF. JOHN R. ALLEN ON "WHAT WE DO AND DON'T KNOW ABOUT HEATING."

The Illinois Chapter of the American Society of Heating and Ventilating Engineers announces that Prof. John R. Allen, dean of the College of Engineering and Architecture, University of Minnesota, will address the chapter on the subject of "What We Do And Don't Know About Heating," at the December meeting and dinner, to be held Monday, December 10th, at 6:30 p. m., at the Engineers' Club, 314 Federal Street, Chicago. Secretary Stacey is anticipating a very large attendance at this meeting, inasmuch as the speaker of the evening is a nationally known authority on heating.

THE STANDARDIZATION OF SANITARY EARTHENWARE.

The National Committee of the Confederated Supply Associations has just issued the report on "Standard Sanitary Earthenware," which was submitted by the Standardization Committee to the National Committee at its recent meeting, in New York City, and adopted, as follows:

New Standards for Sanitary Earthenware.

"Your committee recommends for a standard stock low tank wash down bowl, commonly called a 14-inch minimum roughing bowl when installed with low tank, one that measures from center of outlet to end of spud 6¼ inches with allowance for shrinkage not to exceed ½ inch. This means from center of outlet to end of spud to measure not less than 6 inches nor more than 6½ inches. The bowl to measure from center of seat attachment holes to end of spud 2 inches, with allowance for shrinkage not to exceed ½ inch, which means from center of seat attach-

ment holes to end of spud to measure not less than 1¾ inches nor more than 2¼ inches. The height of this standard bowl from floor to top to be 15 inches with flange or horn extending below floor line ½ inch. Seat attachment holes to measure 5½ inches from center to center. From center of seat attachment holes to extreme front on top 16½ inches. Extreme width of bowl at widest point on top, 14 inches. The foot punched with two screw holes in front and two oblong holes through flange at back and the countersink at outlet in back to accommodate floor flange to be large enough to easily take a floor flange measuring ½ inch thick, 7 inches outside diameter, 4 inches inside diameter.

Reverse Trap Bowl.

"The special features of this bowl and many patents compels most every manufacturer to make a different type, which prevents your committee from recommending one type as a standard. Your committee has no hesitation, however, of placing itself on record that many measurements on this type of bowl be considered standard, for instance, all reverse trap bowls should measure 15 inches from floor to extreme top with flange or horn extending below floor line ½ inch. Seat attachment holes to measure 5½ inches from center to center. From center of seat attachment holes to extreme front of top of bowl 16½ inches. From center of seat attachment holes to end of back supply spud 2 inches with an allowance for shrinkage of ½ inch, which means that from center of seat attachment holes to end of back supply spud not less than 1¾ inches nor more than 2¼ inches. The foot to be punched with two screw holes in front and two oblong holes through flange in back and the countersink at outlet in back to accommodate floor flange to be large enough to easily take a floor flange measuring ½ inch thick, 7 inches outside diameter, 4 inches inside diameter.

Stock Siphon Jet Closet.

"For this bowl, commonly called a 15-inch minimum roughing bowl, when installed with low tank, your committee recommends one that measures 15 inches from floor to extreme top, the seat attachment holes to measure 5½ inches from center to center and from the center of seat attachment holes to the extreme front of top 16½ inches. Said bowl not to measure over 23 inches over all on top. From center of top supply spud to center of outlet to measure 7¾ inches with allowance for shrinkage of ½ inch, which means said closet will measure not less than 7½ nor more than 8 inches from center of top supply spud to center of outlet. This closet must measure, from center of seat attachment holes to center of top supply spud, not more than 4½ inches. The foot of this bowl if outlet is at or near the center of the foot to be punched with only two oblong holes through the flange and the said flange to be the same size as that on the standard washdown and reverse trap bowls. The extreme width of this bowl on top to be 14 inches.

Six-Gallon Tank.

"Your committee recommends that a standard six-gallon tank be one that measures on the average inside 18 inches long, 6 inches wide, 13½ inches high, or corresponding measurements so that said tank will figure 6 gallons capacity, and so constructed to allow for the installing of regular stock fittings when the center of ball cock hole is 2½ inches from extreme back of tank, when center of flush valve hole is 4½ inches from extreme back of tank and the center of ball cock hole is 6 inches from the center of flush valve hole. The lever hole shall be punched ⅝ inch square with corners rounded.

Eight-Gallon Tank.

"Your committee recommends that a standard eight-gallon tank be one that measures on the average inside 20 inches long, 6½ inches wide, 14 inches high, or corresponding measurements so that said tank will figure 8 gallons capacity, and so constructed as to allow for the installing of regular stock fittings when the center of ball cock hole is 2½ inches from extreme back of tank, when center of flush valve hole is 4½ inches from extreme back of tank and the center of ball cock is 6 inches from the center of flush valve hole. The lever hole shall be punched ⅝ inch square with corners rounded.

"Respectfully submitted, E. S. Aitken, the Trenton Potteries Co., Trenton, N. J.; W. B. Maddock, John Maddock & Sons, Trenton, N. J.; B. O. Tilden, American Sanitary Works, Trenton, N. J., committee."

The following resolution was adopted by the National Committee, November 15, 1917:

"Resolved, That this committee unanimously approve the recommendations of the Standardization Committee on Sanitary Earthenware, and respectfully suggests that its action be concurred in by the various associations at their next meetings."

EASTERN SUPPLY ASSOCIATION ENDORSES CONSTRUCTIVE WORK OF GOVERNMENT.

Frank S. Hanley, of New York City, secretary of the Eastern Supply Association, has just issued a special bulletin to members of that organization, from which we quote the following:

"Pursuant to unanimous instructions of our board of directors, we sent to the President, the Vice-President, the speaker of the House of Representatives and chairman of the Council of National Defense, under date of November 9th, the following resolution:

"Resolved, That the board of directors of the Eastern Supply Association hereby expresses its keen sense of appreciation of the splendid constructive work done by the President, the Congress, the Cabinet and Council of National Defense in providing for the effective conduct of the war.

"Furthermore, We believe the quality and unity of service that has been rendered to the nation during the past few months, regardless of party lines, is unparalleled in history, and deserves the fullest measure of approval and support from each and every member of this association."

Under date of November 10th we have the following reply from the White House:

"My Dear Mr. Hanley:

"The President has asked me to thank you cordially for your letter of November 9th. He deeply appreciates this expression of confidence.

"Sincerely yours,

"J. P. Tumulty,

"Secretary to the President."

Under date of November 12th, we received the following from Hon. Champ Clark, speaker of the House of Representatives:

"My Dear Mr. Secretary:

"I write to thank you for the resolution passed by the board of directors of the Eastern Supply Association in approving the splendid constructive work done by our senators and representatives. My own judgment is, no set of men ever worked harder or more patriotically than did the House of Representatives, for which I have a

right to speak. My own judgment after a careful observation is that every member of the House gave to the government his full measure of patriotic duty. Partisan politics, temporarily, at least, was banished from the House, and we all did what we thought was for the best interest of the American people."

MOBILIZATION OF INDUSTRIES.

Representatives of Every Industry in the Country Called to Washington by Chamber of Commerce of the United States as Preliminary Move to Meet Increasing War Problems.

A call has just been issued by the Chamber of Commerce of the United States for a meeting in Washington, December 12th, of the chairmen of war service committees representative of every industry in the country.

They will come to the capital primarily to perfect plans for co-operation with the government. This will develop discussion of many of the vital problems with which wartime industry is confronted—of priorities in transportation, the readjustment of industries to meet war demands, etc.

The industrial mobilization which will center there next week is in pursuance of a resolution adopted at the recent War Convention of American Business held at Atlantic City, which called upon the industries in their own behalf and in order to render the most efficient service to the government to organize war service committees which should in each case be fully representative of the entire industry.

L. F. Hamilton, manager of the advertising and publicity department of the National Tube Co., of Pittsburgh, Pa., has just resigned from this position to assume similar responsibilities with the Walworth Manufacturing Co., of Boston, Mass. The change follows the recent purchase of National Tube Co.'s Kewanee plant by Walworth Manufacturing Co. Mr. Hamilton was graduated from the University of Illinois in 1897, remained with the Western Tube Co. from that year until 1908, having at that time reached the position of sales manager. When the Western Tube Co.'s plant and business was sold to the National Tube Co., Mr. Hamilton was appointed manager of the latter company's advertising and publicity department, a position he has occupied up to the present time. He is a recognized authority and speaker on advertising subjects. Several advertising men in the trade, who are graduates from the National Tube Co.'s advertising department, secured their training under Mr. Hamilton's guidance, among them W. L. Schaeffer, his assistant, who succeeds him as manager of the advertising department of the National Tube Co., and W. A. Phillis, advertising manager of the Borden Co., Warren, Ohio.

Joseph Hirshstein, president of the Josam Manufacturing Co., of St. Louis, Mo., was in Chicago this week in the interest of his business.

John D. Small, consulting sanitary engineer, has moved his offices to Room 1601, 20 East Jackson Boulevard, Chicago.

E. L. Nolan has been appointed representative for the Crown Die & Tool Co., of Chicago, with headquarters at Cincinnati. He will cover Ohio, Indiana and Kentucky. C. J. Weller has been appointed representative for the same company, with headquarters at Newark, N. J., and he will cover New Jersey, Pennsylvania, Maryland, Delaware and Virginia.

T. R. Burke, Pacific Coast representative of the Sloan Valve Co., of Chicago, has been promoted to the position of assistant sales manager of that company, in recognition of service rendered on the Coast, and E. C. Whalen succeeds Mr. Burke as Pacific Coast representative, with headquarters in the Wells Fargo Building, San Francisco.

"PERFECTION" GAUGE GLASSES.

An exceptionally neat folder describing in detail "Perfection" gauge glasses has just been issued by the Beaton & Cadwell Manufacturing Co., of New Britain, Conn. The fact that the war has curtailed the importation of gauge glasses from other countries naturally put the American market in a condition where it was necessary to use home resources to make gauge glasses in America. To fill this demand the above-named company has now placed on the market gauge glasses of American manufacture. The folder emphasizes the fact that these glasses are made especially for low-pressure work.

THE NEW "CROWN" REVERSIBLE DITCH-CORNER RATCHET STOCK.

The accompanying cut shows the new Crown reversible, small ditch-corner ratchet stock, which has just been placed on the market by the Crown Die & Tool Co., of Chicago. This is said to be an exceptionally handy tool for plumbers and steamfitters, who cut threads on pipe in

The "Crown" Reversible Ditch-Corner Ratchet Stock.

ditches, corners, etc., the ratchet being covered so chips and dirt will not clog working parts, and there are enough teeth in the ratchet so that there is no lost motion. The makers also state that the pocket that holds the die is constructed in such a manner that there is plenty of room for oiling and to allow the chips to fall out.

THE "R. & R." PLUMBING AND HEATING COST BOOK.

A cost book originally designed for use in the offices of Richards & Roberts, plumbing and heating contractors, at Stamford, Conn., has just been published by that firm, owing to the fact that they considered it of such practical value that it ought to be available to the public. This book contains about 17,000 net prices. The various commodities are figured out at different discounts so that all the user needs to know is the discount, and his net price is there. A sheet is provided in front for determining one net discount for a group of discounts. The firm has copyrighted this book, which is sold for $13 bound in flexible leather and $10 bound in cloth. The dimensions of the book are 9 by 11½ inches.

THE METAL MARKET AND TRADE REPORTS

Steel and Iron.

The first step taken by the General Operating Committee of the Eastern Railroads, the body constituted the last week to conduct the railroad pool, will result in increasing the production of both pig iron and steel. Traffic congestion is already being relieved in the Pittsburgh district. Because of car shortage, shipments of Connellsville coke have been 17 per cent less in 1917 than in 1916, causing a decline in the production of pig iron, although there are more by-product coke ovens, and blast furnace capacity of the country has been increased almost 10 per cent, besides there has been restriction in production and finishing of steel in the Youngstown district caused by a shortage of coal. The initial orders of the railroad pool included a diversion of a large amount of freight, so that it would not be compelled to pass through the Pittsburgh gateway. It is significant that while the pig iron producing capacity of the entire country is about 43,000,000 tons, the actual production during recent months has been at the rate of only 39,000,000 tons, and while steel ingot producing capacity is about 50,000,000 tons, the actual rate has been about 44,000,000 tons. Even partial relief from traffic congestion would bring about an increase in production of both pig iron and steel, and a free movement in the Pittsburgh district would contribute largely to that result. The embargo upon shipments for export of pig iron and steel products will help the domestic situation somewhat because there is already 1,325,000 tons of material at points on the coast awaiting vessels, but export shipments from mills and furnaces have been rather light lately. No concessions are being made from the set prices of pig iron, unfinished steel and finished steel, the demand being larger than that of the supply. There is a good movement in sheets and wire products and some mills are well stocked with orders as a result. In wire products, offerings have been freer since prices were set. A larger volume of specifications against contracts for commercial steel has developed and the showing for November promises to be larger than for October. There has been also heavy contracting in sheets and tin plates for the first quarter of 1918. The increase in the steel business is attributed to the fixing of prices, which has produced a more settled condition. Buyers and sellers know where they stand as to prices, and there is no uneasiness because of uncertainty regarding prices. Steel has been getting less plentiful on account of restricted production, and the trade is confident of a more active market in consequence. The Russian situation will have the effect of releasing considerable capacity for locomotive and car building, as it now appears certain that under present conditions this government will not permit exports to that country. Supplies and machinery which were boxed ready for shipment have been held up. Plans of the Baldwin Locomotive Works to build a shop on the Trans-Siberian Railway have been suspended, and the order may be permanent if Russia makes separate peace with Germany. More than 30,000 cars and 1,500 locomotives were recently ordered by the Russian government, and the productive capacity, which these orders would have employed, will undoubtedly be directed to American needs. But such relief will not be manifest for several months yet. During the first week the demand for pig iron has been more insistent, and a conservative estimate is that there have been inquiries for an aggregate of 150,000 tons in the Pittsburgh district alone, a large part of which must remain unsatisfied because of the sold-up condition of blast furnaces and their inability to attain capacity production without a larger supply of coke. Prices for pig iron are based upon the old standard grades of No. 2 foundry, a basic iron at $33 a ton at the furnace, and will be operative until January 1st. All prices are also based upon f. o. b. delivery at the furnace.

Copper.

There is a great deal of speculation and apprehension as to the conditions under which copper may be distributed by dealers to smaller consumers. Government authorities insisted for awhile upon a flat price for copper of 23½ cents a pound to apply to all purchases, but as the copper-producing interests were not in position to furnish less than carload lots to anyone, the chances of the smaller manufacturers securing the comparatively small lots they needed were nil, if the regulations were to be carried out to the letter. If these concerns were to be deprived of copper, they would naturally be forced to close their plants, and industry would be crippled and disorganized. No relief followed the petitions of jobbers that they be allowed to distribute copper in small lots at a price in excess of 23½ cents for some time. But finally they were granted permission to sell at an advance of 5 per cent, which would make the price to the the consumer 24.675 cents a pound and permit the dealer who bought in car lots and sold by pound a profit of 1.175 cents a pound. The Copper Producers' Committee in control of distribution has agreed to release a certain quantity of copper in this way. When the high-price copper in dealers' hands is off the market, copper will be absolutely controlled by the established prices.

Tin.

Considerable excitement was caused in the tin trade during the week by the commandeering of all tin in New York, Philadelphia and Boston warehouses by the Navy Department. This tied up the market and added to an already trying position, as no tin could be withdrawn until an analysis of all stocks could be made, and that takes considerable time. This action produced a protest by the Sub-Committee on Tin of the American Iron and Steel Institute, which is empowered by the government to govern the distribution of the metal in this country. As a result, news was sent from Washington on Friday that the greater part of the commandeered tin would be immediately released and that in the future the Navy

Department would look to the committee for its requirements. It was also announced that some relief from the present shortage of spot tin would follow soon as a result of negotiations with the London authorities, who have been holding up large quantities, the property of American importers in Singapore and London, the want of which has seriously interfered with industry in the country. Prices are only nominal. Straits being quoted at 80 cents a pound. A small lot of Banka was offered at 85 cents.

Lead.

The lead market is very quiet and principal producers are quoting New York delivery, all positions at 6¼ cents and East St. Louis at 6.17½ cents, but the figures really represent only the settling prices for current contracts.

Spelter.

Awaiting some announcement from Washington as to an established price for spelter, which may come at any time, the market remains quiet with quotations for New York delivery at 7⅞ cents to 8⅛ cents.

Old Metals.

In New York the following prices are current for old metals per 100 pounds:

	Buying.	Selling.
Copper, heavy and wire	$21.00 to $21.50	$23.00 to $23.50
Copper, light and bottoms	18.50 to 19.00	21.00 to 21.50
Heavy machinery composition	21.00 to 22.00	23.00 to 24.00
Brass, heavy	14.00 to 14.50	15.00 to 16.50
Brass, light	11 00 to 11.25	11.75 to 12.00
Lead, heavy	6.00 to 6.12½	6.25 to 6.37½
Tea lead	5.00 to	5.75 to 6.00
Zinc scrap	5.00 to 5.75	6.50 to 7.00

The buying prices are those which the larger dealers will pay; the selling prices are market quotations.

Porcelain Enameled Ware.

The question of future price on porcelain enameled ware having been the subject of much thought and discussion, many men in the trade holding the view that as the price of pig iron is fixed by the government at $33 instead of $53, there should be a corresponding reduction in the price of enameled ware, the Standard Sanitary Manufacturing Co. last week issued a circular letter to the jobbing trade, from which we quote the following:

"We believe we are correct in saying that the enameled ware already made and in stock and the enameled ware that will be made for some time to come will be made of iron costing much more than $33 per ton. Iron is the only commodity that has been reduced in price. On the contrary, every other item, labor included, has increased. The price of chemicals is still advancing and no prospects for lower prices while the war lasts. Fuel of all kinds is higher than it ever was in the history of this industry. There is still a further condition which confronts the manufacturers of enameled ware, as well as all other manufacturers, and that is the difficulty of obtaining raw materials from which to produce the finished goods we sell, so, after a careful survey of the entire situation, we are constrained to say that we see no immediate warrant for lower prices on enameled ware."

Pneumatic Storage Tanks.

Some manufacturers have announced a reduction of 10 per cent in the price of pneumatic storage tanks.

RADIOACTIVE LEAD LATEST WHITE METAL DISCOVERY.

According to Prof. T. W. Richards, of Harvard University, a new kind of lead has been discovered—a metal which emits strange rays and has upset several preconceived notions of chemistry. The professor is quoted by the "Boston Herald and Journal" as saying that, treated by all ordinary means, it cannot be distinguished from ordinary lead and would make quite as good pipe as the metal now used. Scientists have called the new metal radioactive, or isotopic lead.

When the true relations of lead to the radioactive variety become known, Professor Richards believes, a great advance will have been made in our knowledge of the fundamental nature of the elements and to what extent the transmutation of the elements, for centuries a dream of alchemy, may be attainable.

"Radioactive lead may supply chemistry with the key to many things now concealed from us," says Professor Richards, who is director of the Wolcott Gibbs Memorial Laboratory at Harvard, built a few years ago for advanced work in chemistry. "It is an extremely interesting substance, for, although it cannot be distinguished by ordinary tests from ordinary lead, it exhibits the peculiar property of radioactive and is apparently derived directly from radium and indirectly from uranium.

"I think I could safely defy the ordinary man, under ordinary conditions, to distinguish the radioactive lead from the common variety. It is a task that the chemist would find difficult, apart from the phenomenon of radioactivity, for its appearance and physical and chemical properties are the same. Its atomic weight, however, is distinctly less. Repeated and careful determinations have shown that conclusively. If it were greater it would be easy on the surface to jump to the conclusion that a continuation of the radioactive emanation would bring the atomic weight down to the normal figure. Since the condition is quite the opposite, no such explanation is possible.

"Radioactive lead appears almost always in conjunction with uranium, and with trace of radium. From the investigation we have made, it would appear that uranium is the starting point; that this gradually disintegrates into radium, through the process of radioactivity, and that radium in turn distintegrates into the lead. Professor Boltwood, of Yale, was one of the first to notice this condition.

"Transmutation of the elements therefore, now seems to be a fact as regards one or two elements, and we are devoting our energies to research that will show as clearly as possible just what relations actually exist among the elements.

"The relation between lead and radioactive lead is not without apparent analogy in long-known facts of chemistry. For example, iron and manganese have atomic weights almost equal, and in some respects the metals are very much alike. There are, however, marked differences. Perhaps the two metals which resemble each other most clearly are nickel and cobalt, whose atomic weights are almost the same. But lead resembles radioactive lead more closely than either of these pairs."

John B. Dunbar, of Wilmington, Del., has secured the contract for the installation of plumbing systems in 200 workingmen's bungalows, to be erected at a cost of $1,800 each, at Carney's Point, N. J. Spaces for the foundations for the bungalows have been excavated.

AMONG THE PLUMBING AND HEATING CONTRACTORS

Illinois

Chicago and Vicinity.

Elaborate preparations are being made by the North and Northwest Master Plumbers' Pleasure Club for its annual reception and ball, which is to take place on the evening of December 12th, at Northwest Hall, West North Avenue, near North Western Avenue. The club is extending a cordial invitation to master plumbers in all parts of the city to attend this affair. The grand march will be led by Mr. and Mrs. Paul Jacoby. The entertainment committee consists of the following gentlemen: Chairman George Leebody, W. R. Black, E. C. Wagner and Frank E. Pearson.

Thirty-four applicants for master plumbers' certificates took the examination prescribed by the Board of Examiners of Plumbers, at 1008 City Hall Building, Thursday morning, December 6th. C. J. Herbert and William Petrie conducted the examinations.

Noble & Thumm, of 2313 Lincoln Avenue, have been awarded the contract for the installation of the plumbing system in a leather factory, to be erected at a cost of $150,000, at Division and Branch Streets.

The Roberts Plumbing Co., of 4710 North Western Avenue, will install the plumbing in a thirty-six apartment building, to be constructed at a cost of $140,000, at 541 Arlington Place. The heating contract went to Thomas J. Douglas & Co., of 160 North Dearborn Street. The architect is R. G. Pierce, 10 South LaSalle Street.

The W. J. Walsh Co., of 163 West Illinois Street, has secured the contract for the installation of the heating system in a building of fifty-four apartments, to be constructed at a cost of $140,000, at 4251-4257 Broadway. The architect is Paul F. Olson, 127 North Dearborn Street.

M. Raskin, of 2109 Division Street, has been awarded the contract for installing the plumbing and heating systems in a store and loft building, to be erected at a cost of $16,000, at 2247-49 West Division Street. The architect is A. L. Himmelblau, 179 West Washington Street.

George H. Kirk, of 6711 Wentworth Avenue, will install the plumbing system in a roundhouse, repair shop and office building, to be constructed at a cost of $50,000, on Avenue N, between 97th and 98th Streets. The heating system will be installed by John Donough, of 10 West 45th Place.

Thomas Donlan, of 7245 South Halsted Street, has been awarded the contract for the installation of the plumbing system in a four-apartment building, to be erected at a cost of $10,000, at the corner of Carpenter and 85th Streets. The heating contract was awarded to Wiley & Co., of 1215 West 69th Street.

V. A. Smith, of 231 West Lake Street, has secured the contract for installing the heating work in a two family apartment building, to be erected at a cost of $5,000, at 7137 South Park Avenue.

Baldwin & Glasson, of 208 North Fifth Avenue, will install the heating system in a factory to be erected at a cost of $20,000 at 2447-58 West 48th Place.

The contract for the installation of the plumbing system in a building of six apartments, to be erected at a cost of $15,000 at 6359 Bishop Street, has been awarded to Fred Fahlstrom, of 444 East 76th Street.

The Arcade Steam Heating Co., of 126 West Kinzie Street, has been awarded the contract for remodeling the heating system in an office building at 158-60 West Institute Place.

The South Shore Plumbing Co., of 7448 Stony Island Avenue, will install the plumbing system in a new residence at 7120 Vernon Avenue.

Other Cities in the State.

Hitchcock Bros. Co., of 104 South Washington Street, Lincoln, has been awarded the contract for the installation of the heating system in a warehouse to be erected at a cost of $150,000 in that city.

D. E. Rhodes, of 410 Broadway, Lincoln, will install the plumbing and heating systems in an addition to the Monroe School to be erected at a cost of $20,000 at 726 North Sherman Street, Lincoln.

Kasjens & Entwistle, of 421 Hamilton Street, Peoria, will install the plumbing in two foundry buildings, to be erected at a cost of $70,000 in Averyville, near Peoria.

Ruhaak & Lackman, of Pekin, have secured the contract for the installation of plumbing and heating systems in a new public comfort station in that city.

Powell & Eickelberger, of Taylorville, will remodel the plumbing in the Empress Picture Theatre in that city.

Indiana

Indianapolis and Vicinity.

Although the value of building operations in Indianapolis for the last few months has been much less than the value of operations for the corresponding period of 1916, optimism continues to prevail among the plumbing and heating contractors of the city. Practically all of them are of the opinion that there will be a pronounced increase in building activity after the first of the year, and they are laying their plans accordingly. With factories going at top speed, with the establishment of many new industries to take care of government war orders—thus giving employment to nearly every one that wants it—and with local banks just "chuck full" of money, there is every reason to believe, the plumbing contractors say, that the new year will bring additional prosperity. Several new business buildings are to be erected after January 1st, and a number of residences in the outlying districts are being remodeled and converted into more modern apartments.

Henry Hudson, chief clerk of the department of public buildings, has submitted his report for the month of November, showing that building operations in Indianapolis for that time amounted to $400,200. The value of operations for the corresponding month of last year was $721,076, a difference of $320,876. The value of operations for the first eleven months of last year was $8,407,-

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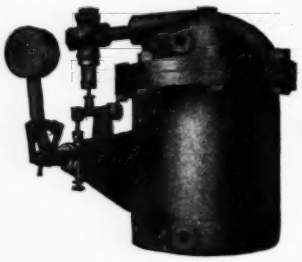

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030, compared with $7,017,159 for the corresponding period of the current year, or a loss of $1,389,871.

J. C. Dunn & Co., of 936 North Illinois Street, have been awarded the contract for the installation of the plumbing and heating in a new $10,000 store, office and apartment building, that is to be erected at Cornell Avenue and Sixty-third Street for Fred A. Kasabaum.

Hayes Bros., of 228 West Vermont Street, have received the contract calling for the installation of the plumbing and heating in the new airplane warehouse that is to be erected by the United States Government on the grounds of the Indianapolis Motor Speedway, a few miles west of the city. Work will be started immediately.

Other Cities in the State.

Construction work in Lafayette will soon proceed apace, if two pending contracts are let as per schedule. The Lafayette Life Insurance Co. will soon open bids for the construction of a ten-story building at Third and Main Streets, and the board of directors of the Home hospital there are preparing to let contracts for tne erection of two large additions to the hospital.

The H. G. Newman Plumbing Co., of Evansville, has received the plumbing and heating contract on the new West Bend Junior High School in the new Forrest Hill addition in the western part of the city. The building will cost approximately $200,000.

Otto Binder, of 806 Columbia Avenue, Hammond, will install the plumbing in the new $6,000 residence that is to be erected at 908 State Boulevard for Walter Tankel. The heating contract was awarded to the Forest Park Sheet Metal Co., also of Hammond.

The Martin Plumbing Co., of 710 Buchanan Street, Fort Wayne, has been awarded the contract for remodeling the plumbing in a down-town bank and office building in that city. This company also has the contract for the installation of modern plumbing in the new hospital that is to be erected by the Allen County Hospital Association at a cost of $70,000.

The new swimimng pool of the Culver Military Academy, at Culver, was formally opened Wednesday, November 28, by an exhibition by a picked team of swimmers from the Chicago Athletic Club, and Miss Thelma Darby, a fourteen-year-old swimmer of Indianapolis. The Culver pool, one of the largest and most complete pools in this part of the country, is 120x60 ft. in dimensions, more than double the size of the Chicago university pool, and almost twice as large as the pool at Yale. Its depth runs from three and one-half feet to nine feet, and the pool is so constructed that beginners will have the full length of the pool in shallow water. The water for the pool is drawn from Lake Maxinkuckee, and before reaching the pool passes through two sand filters, heaters and violet ray machines to ensure its complete purity. In addition, the circulation is so arranged that the entire body of water will pass through the purifying process every thirty hours, and the loss through evaporation and the spillway will be replaced by the daily addition of 5,000 gallons of fresh water,

The Outhouse Ordinance in the City Council of South Bend.

After a discussion lasting nearly two hours, the South Bend city council, at its meeting last Monday night, blocked the efforts of Mayor Keller and his advisors on the city health board to remove the danger arising out of the prevalence of privies or outhouses in all parts of the city, by recording a tie vote on the so-called "outhouse" ordinance.

The ordinance would do away with all outhouses in the city and would install sanitary plumbing instead of them. The property owners would be forced to install the

sanitary plumbing and would be permitted to pay for it by increased taxation or monthly installments, the city acting as the bonding company for the plumbers.

The men who caused the deadlock in the council are Councilman Wolter, Goebel, Miller, Hagerty and Duszynski. All of these men voted against the ordinance on the plea that "it costs too much," and urged that the entire proposition be postponed until "after the war." The meeting was attended by about fifty citizens, representing various civic clubs and organizations. Among all these citizens not a dissenting voice was heard.

At the conclusion of the session Councilman Hagerty made a motion to postpone the ordinance, and this was seconded by Councilman Wolter. According to parliamentary law, "indefinite postponement" is only a polite way of killing a measure. The motion was voted upon, after some argument, and resulted in another tie. Councilman Goebel then suggested that the ordinance be carried over for two more weeks. The motion was finally carried and the measure will be up for discussion again at the next regular meeting.

"It would be foolhardy to postpone action on a sanitary measure which threatens the lives of the children and the grown-ups as well until after the war," said Dr. Charles Bosenbury, secretary of the board of health. "This is the time to wipe out typhoid, and this ordinance is an extremely important one in that respect. At the present rate, however, it will take South Bend at least twenty-five or thirty years to rid itself of the menaces of the outhouses."

"I am absolutely in favor of the outhouse ordinance because I believe it is a question of life and death to the people of South Bend," said Mayor Fred W. Keller. "We have been careless in regard to these matters in the past. When we employ doctors we take their advice, and all doctors are agreed that open vaults are responsible for most of our sickness and deaths. It is time that we substitute sanitary plumbing for them."

The mayor quoted the secretary of the National Housing Association as saying that the vault is probably responsible for more disease and sickness than any other factor, and that the presence of a large number of open vaults in closely built up communities is, in the opinion of many sanitarians, the most serious menace from the health point of view.

Councilman Wolter said he was opposed to the measure because of the high cost of plumbing and plumbing materials, to which the mayor replied: "Yes, plumbing does come high. But doctors come high and idleness from illness comes high, and life itself comes high."

While the councilmen were on the subject of prices for plumbing, Irving Sibley, a South Bend master plumber, submitted figures showing that the plumbing installations would range in cost from $85 to $150. He said it needs certainly not be any higher than that, and other plumbers who were present at the session corroborated his statements.

At this juncture, Councilman Thompson, who is supporting the measure, said: "Prices for plumbing are high now, it is true. But it is also true that labor is high. For that reason the laboring man is better able now to pay for the work than he will be later, because when prices go down labor will be the first to drop."

Much interest is being manifested in the outcome of the ordinance, and it is probable that a large crowd will be present at the next session of the council, when the ordinance is finally acted upon.

It is to be hoped that all the members of the city council, after calm deliberation of the importance of the new ordinance, will give it their official O. K.

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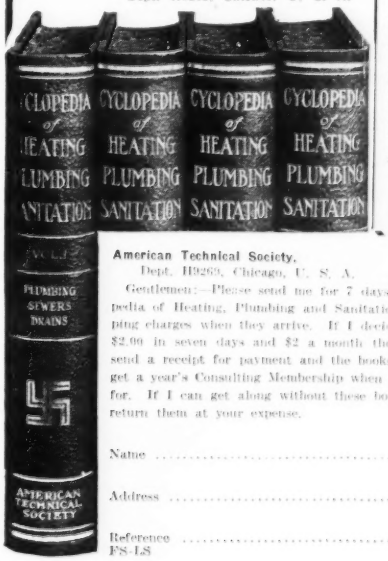
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Wisconsin

Public Toilet Room Requirements in Wisconsin.

Frank R. King, state plumbing inspector for Wisconsin, has issued the following open letter to plumbers in the state, under date of December 1, 1917:

"In order to guard against violations and to aid the departments in enforcing the requirements in connection with public toilet room construction for a new installation, or alterations in an existing building, as provided in the state building and plumbing codes, your attention is directed to the following:

"A. Where no local building or plumbing inspection department exists these requirements will be enforced, so far as practicable, either by the State Board of Health or the Industrial Commission, or by them jointly, through their authorized inspectors.

"B. Where local building departments exist, the requirements are to be enforced with the co-operation of the local plumbing inspection department.

"C. Where no local building department exists, the local plumbing inspector, where such department exists, will in co-operation with the Industrial Commission and the State Board of Health enforce these requirements.

"Where the partitions and floor of such toilet rooms are designed and constructed by a carpenter, mason, or other contractor, the state building code makes them responsible for compliance with the requirements relating to construction, location, light, ventilation, etc. If the plumbing contractor designs and constructs such partitions or installs fixtures in a closet or room not formerly used as a toilet room, and where no new partitions are built, then the plumbing contractor will be held responsible for compliance with these requirements.

"Under Chapter 133, Laws of 1917, these general orders apply alike to architect, builder and owner, and are enforcible under a forfeiture of not less than $10 nor more than $100 for each offense. For approval of plans for public toilet rooms, see pages 78 and 85 of the code.

"It is important that plumbers be familiar with the requirements herein outlined, which aim to secure efficient toilet facilities in the interest of all concerned."

Minnesota

St. Paul.

Permits issued recently at the office of the city plumbing inspector include one to John McQuillan for plumbing work on the two-story brick building at the Linnea Old Folks' home, Como Avenue and Gibbs Street. The work will amount to $1,050. Mr. McQuillan also has the contract for plumbing work on a one-story brick building being erected at Twelfth and Cedar Streets.

M. J. O'Neill has secured the contracts for installing plumbing in four new residences.

Paul F. Manteuffel is doing the plumbing work on the frame residence being erected by the Lily Construction Co.

Charles J. Bergstrom has secured the contract for installing modern plumbing in a new two-story brick building for John D. Anderson, at Payne Avenue and Case Street. The contract amounts to $700.

George W. Coverdale has secured the contract for the plumbing work on the residence which G. Kreiger is erecting at Herschell and University Avenues.

Minneapolis.

Belden-Porter-Gray Co., 914 Mary Place, Minneapolis, has recently secured the following contracts: Heating and plumbing John S. Pillsbury's residence at Lake Minnetonka; consideration $25,000; heating and plumbing the new addition to Northwestern Hospital; heating and plumbing the Builders' Exchange, a 12-story office building, and heating and plumbing Levine Bros.' factory and Emerson Brantingham's factory building.

Iowa

Edward Vollers, of 615 Front Street, Fort Madison, has secured the contracts for the installation of plumbing in the new $50,000 public school in that city, plumbing in the Reading and Club Building for the A. T. & S. F. RR. Co., also in Fort Madison, and plumbing in twenty-one new dwellings for the employees of the Perfection Tire & Rubber Co.

The Ryan Plumbing & Heating Co., of Davenport, has secured the contracts for the installation of plumbing and heating systems in the Chicago & North Western Railroad Co.'s new roadhouses at Milwaukee, Wis., and Nelson, Ill.

Missouri

St. Louis and Vicinity.

The Missouri State Association of Master Plumbers has started an educational campaign and have prepared a bulletin to be distributed among the members of the association throughout the state. This bulletin, under the caption of "Business Management," applies to both contract work and to repair work. Every detail of shop management is treated, under the subheads of salesmanship, efficiency, bookkeeping and shop appearance. The object of this bulletin is to have the various organizations throughout the state discuss the suggestions which are made in the bulletin and adopt such as they approve. In order that they may do this more intelligently the association will from time to time send out further bulletins, which will treat each item separately. Suggestions are also requested in order to further the work of the campaign.

The first bulletin consists of an outline of the methods, which have been suggested, and will be mailed soon by President A. A. Zertanna, of the Missouri State Association. "What the Beginner as a Master Plumber Needs," is a heart to heart talk, which is also included in the initial bulletin for the instruction of new members.

The following outline of what the average plumber needs is given:

Business Management.

Contract Work and Repair Work.

Salesmanship—(1) Merchant as well as a plumber. (2) Courtesy. (3) Business knowledge. (4) The use of a better grade of fixture. (5) Standard specifications.

Efficiency—(1) Good workmanship. (2) Honest execution of plans and specifications. (3) No substitutions. (4) No delay of work on your part.

Bookkeeping—(1) True to yourself and overhead expense. (2) Prompt collections. (3) Better work on contracts and moderate profits on repairs, and if work ordered will run up to a large amount, give an approximate cost before starting same. (4) Rendering of bills: Make same more explanatory, giving details on nature

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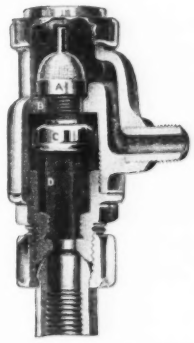

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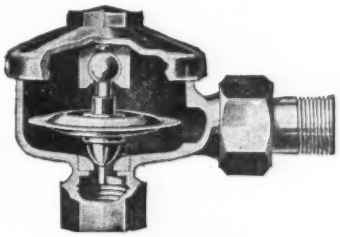

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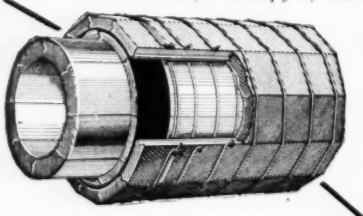

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of repairs and where same have been made, rather than itemizing material and time.

Shop Appearance—(1) Sample room. (2) Arrangement of stock. (3) Cleanliness of office and show room.

The bulletin also deals with the new entrant into the business in the following admonition to master plumbers' associations:

What the Beginner as a Master Plumber Needs.

The journeyman who thinks that he is proficient enough to become a plumbing contractor, it matters not if he has served many years at the trade or just served part of his time, should be taken hold of at once and be taught a few very concise principles of the business, before he financially bankrupts himself and his neighboring master plumbers in trying to compete with him.

As soon as he takes out his licence as a master plumber, he should be brought to the local association and taught the principles of the organization.

Teach him to crawl before he runs.

To only take a limited amount of work.

To cultivate a spirit of friendship, honesty and trust with his fellow master plumber, for he, in later years, will be the standard bearer of the organization, and its strength is only in proportion as each individual has confidence in one another.

Teach him how to make a fair profit.

To charge for his own individual work and also to figure on the new work on the basis that would be used had he journeyman plumbers doing the work, for he must remember that though he may be able to underbid a master plumber who employs journeyman plumbers, when he does his own work and figures it at only a journeyman's pay or less, that he in turn, when he has expanded and needs to employ help, will be in the same position as those whom he was underfiguring, and at the end of the year after deducting overhead expense will not make a fair day's wages.

To keep an accurate account of all of his expenses so as to know what per cent is his overhead expense.

To never fail to add the overhead expense to all estimates given and to all jobbing work.

To attend strictly to his own business and not brag about how much money he makes nor cry about the amount he lost on some job. To teach him to be an active member in the association and to attend regularly the meetings, as it is as important as going to his place of business each day. To put him in some minor office in the organization as he shows an interest, so he can develop what he has in him.

Kansas City and Vicinity.

Plumbers of Kansas City are engaged in actively opposing an issue known as the "Building Code," which is to be submitted and voted upon by the city council soon. The issue, which has been in the hands of a special committee for the past year, concerns directly several lines of trade in the city.

Both the Association of Master Plumbers and the Plumbers' United Association object to the passage of the bill on the grounds that tile pipes, which it allows, are easily broken and for this reason not sanitary. They are not practical as they do not last as well as iron and are often installed by inexperienced workmen, and while the cost of installing tile pipes is less in the beginning by about 15 per cent the cost in the long run is 50 per cent greater, they are urging.

Aside from this objection, the plumbing section is so

burdened with verbiage that many of the points may be construed in several ways, the plumbers claim.

Later: The plumbing section of the Building Code proposed recently in Kansas City was killed in a session of the combined committees of the upper and lower houses of the city council. Twenty representatives of the Master Plumbers' Association and fifteen men from the Journeyman Plumbers' Association were present and stated their reasons for opposing the clause. Independent plumbers endorsed the movement.

As the clause stood it would have permitted, legally, work that would have produced insanitary conditions in homes and office buildings by licensing the use of tile pipes for drainage, according to the plumbers' claims. Work could have been done by inexperienced help picked up from the streets, or handled by the workmen who are paid twelve dollars a week, it was stated. As this tended to make work cheaper, public opinion favored its passage. The Kansas City Real Estate Board also supported the enactment of the ordinance. After considering the facts presented by both sides of the case the council unanimously struck out the measure.

California

San Francisco and Vicinity.

The market situation here has not changed greatly in recent weeks. No great amount of private work is on hand or in prospect for the immediate future, but a good deal of public work is in plan.

The Gilley-Schmid Co. has been awarded the contract for the installation of a low-pressure steam heating and hot water supply system and for the oil burning equipment for the L. J. Etter apartment building, on Pearl Street.

The Navy Department is in the market for a quantity of plumbing goods for the Mare Island Navy Yard in San Francisco Bay. The requirements include: Brass cocks, bibb hose cocks and composition steam and water fittings.

The General Contractors' Association of San Francisco, has come out with a strong protest against the growing tendency on the part of architects to call for bids as a whole and for segregated bids, both at the same time, as well as against the practice of calling for many alternate bids. These practices are particularly common on the part of school boards and other public bodies. The contractors claim that these practices are not only bad for the contractors, but for the owners as well.

Other Cities in the State.

Plans are now being drawn for a new agricultural pavilion for the state fair grounds at Sacramento. The building will be a fireproof structure and will cost about $300,000.

The plumbing firm of Ellis & Anderson, of Los Angeles, has been dissolved.

Health Commissioner C. R. Blake, of Richmond, has ordered the installation of eight sanitary drinking fountains on as many prominent corners in that city.

Sealed bids have been called for for the furnishing and installing of high and low-pressure steam heating systems in the Los Angeles County Hospital, at Los Angeles.

The city council of Fullerton has called for alternate bids for 1,100 feet of cast iron or standard-welded 4-inch pipe, and for valves, fittings, hydrants, etc.

The Fresno Natatorium Co., of Fresno, has secured a

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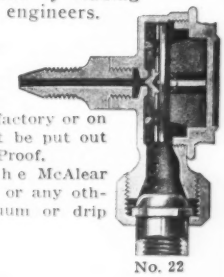
Vapor Heating System. Vacuum Heating System.
Vacuum Air Line System.
Two-Pipe Vacuum System.

Perfect heat without noise, leakage, damage or waste.
The biggest forward step in the science of steam heating.
Preferred and endorsed by leading architects and heating engineers.



McAlear Thermo Vent Automatic Air Valve.
So designed and constructed that no adjustment is necessary either at factory or on the job. Cannot be put out of order. Fool-Proof.
Used with the McAlear Vacuum System or any other air line vacuum or drip pipe work.

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McAlear Automatic Vacuum Pump.
Adaptable to all kinds of steam heating systems, new or old.
Quick-acting. Simple. Economical.
Requires 80% less power than any other pump doing same work.
The ONLY pump that has for its power plant a thermostatic motor actuated by temperature of steam and water.
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for steam pipes and all high pressure work where strength and durability are required. It works easily, fits snug and does not "sag." It is light, yet tough and will not "fall" in cutting. It contains extra long fibre Asbestos, Carbonate of Magnesia and other fireproofing materials, all of excellent quality.

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Made in sizes and patterns to meet any requirement.

Hard rubber Valve Discs for use in Jenkins, Walworth, Frink, Kelly & Jones, Belknap, and Lunkenheimer type valves.

Not affected by heat, steam, oils or acids.

Solid Bibb Discs for all regular sized faucets.

Our line of Plumbers' Rubber Goods is most complete. Write for Catalog, prices and discounts.

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Railroad Avenue and Garden Street
Bridgeport, Connecticut

Brass Goods That Make Good
everywhere they are installed

TRENTON
Boiler Couplings

Made in styles suitable for all kinds of boilers.

We also make the "Trenred"—a heavier coupling of red brass.

The Trenton Line of Plumbers' Brass Goods is carried by all jobbers

The Trenton Brass & Machine Co.
Trenton, New Jersey

permit for a bath house and natatorium to cost approximately $33,000.

Pasadena is in the market for 5,400 feet of 6-inch cast iron pipe and for a varied assortment of fittings.

Massachusetts

Boston and Vicinity.

William J. Starr, secretary of the Boston Retail Credit Men's Association and vice-president of the Credit Reporting Agency of New England, spoke before the members of the Master Plumbers' Association of Boston and Vicinity on Tuesday evening, November 27th. His subject, "Credit Protection," proved very interesting to the members.

The midwinter ball, which has been an annual affair with the Boston Master Plumbers' Association for many years, is to be omitted this year. The war and the consequent high cost of everything, that goes to make a ball a success, are mainly responsible for the decision to omit the affair this year.

Fred K. Armstrong.

Fred K. Armstrong, executive secretary of the Master Plumbers' Association of Boston and Vicinity, has been called into the national service and reported a few days ago at the headquarters of the Quartermaster General at Washington. Some years ago Mr. Armstrong was a member of the National Guard and was assigned to the same department, and at the outbreak of the war with Germany he notified the department that his services were at the disposal of the government at any time. Although the call came suddenly Mr. Armstrong was prepared and started for Washington within a few days. For the present R. C. Van Amringe, the association attorney, who has an office with the secretary at 166 Devonshire Street, Boston, is looking out for the work of the secretary. The directors will meet later to discuss the question of a successor to Mr. Armstrong.

J. J. Hurley & Co., of 2 Columbia Street, Boston, have the heating contract in connection with the remodeling of St. Joseph's Roman Catholic Church, at Needham.

Major Edward Canfield, construction quartermaster at Camp Devens, has completed his inspection of the heating plant at the cantonment and announced this week that he is satisfied with the job and will accept it on behalf of the government as "satisfactory and in conformity with the contract." The installation of the plant cost about $1,000,000. About 700 tons of coal per day are required to run the various heating units.

Alexander Hunter & Co., of Wareham, have been given the contract for installing plumbing and heating systems in a large building in that town, being remodeled for use as an armory by the state guard. The Hunter company's bid of $1,895 was the lowest received.

The state is preparing to erect a public comfort station at Ayer, where the national army cantonment is located.

Max Radding and Joseph Radding, doing business at

Springfield as plumbers and sheet metal workers under the firm name of the Radding Co., have filed a petition in bankruptcy. Their liabilities amount to $47,403 and their assets are scheduled at $25,829, of which $22,000 represents real estate and $3,329 accounts due.

New York

New York City and Vicinity.

Baker, Smith & Co., of Manhattan, have secured the contract for the heating work in a new $250,000 office building at Front Street and Maiden Lane. Alexander Bryant & Co., of Manhattan, will install the plumbing work.

Philip Yockel, of 756 Fox Street, Bronx, will do the heating work in a new garage in course of construction at Southern Boulevard and 183rd Street.

W. H. McKiever, of 1123 Broadway, Manhattan, is installing the heating work in connection with the alteration at the National Park Bank on Ann Street.

Michael Dumey, of 98 Jerome Street, Brooklyn, will install the heating and plumbing work in two new apartment buildings at Sheffield and Dumont Avenues.

The Crooke Heating & Ventilating Co. will do the heating work in a new storage shed in course of construction at the Brooklyn Navy Yard.

Baker, Smith & Co., of Manhattan, are doing the heating work in a new bank building at Broad Street and Fairmont Avenue, Philadelphia.

W. A. Schneider, of White Plains, will do the plumbing and heating work in a new residence and garage at Little Orchard.

Other Cities in the State.

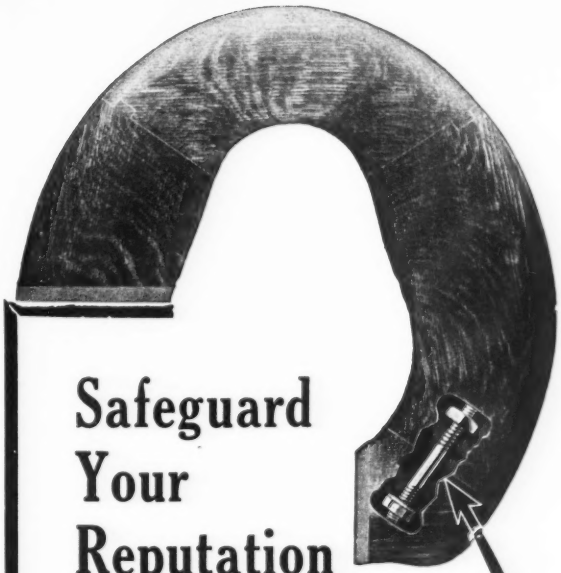
O'Shea & Larkin, of Rome, have secured the contract for the plumbing and heating work in a new garage and chauffeur's quarters on North George Street, for Herbert Dyett.

The Old Forge Hardware Co., of Old Forge, will install the plumbing and heating work in the new camp and cottages of O. M. Eidlitz in the Adirondack Mountains.

Edward Joy Co., of Syracuse, is doing the heating work in a new signal tower at Buffalo for the New York Central R. R.

A consolidation has recently been effected between the master plumbers' associations on Long Island, namely: Queens County branch of Master Plumbers; Master Plumbers, Steam and Hot Water Fitters' Association of Suffolk County and the Association of Master Plumbers, Steam and Gas Fitters and Sheet Metal Workers of Nassau County. Delegations of the different associations will attend each others' meetings and discuss the trade happenings of the three counties. Meetings such as these, where ideas and views are freely exchanged, should prove beneficial to the trade. Harry Laegen, secretary of the Suffolk County association, attended a recent meeting of the Nassau and Queens associations and invited their co-operation in the above work and was assured of their hearty support.

In Huntington, twelve master plumbers are engaged in business, eleven of the twelve are members of the Suffolk County Association of Master Plumbers, and at a recent local meeting it was decided that they adopt a plumbing code similar to the one now in use in the city of New York. Beginning January 1, 1918, all work will be in accordance with this code. They believe that when the



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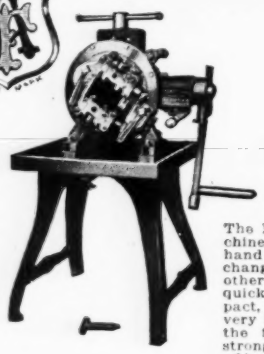

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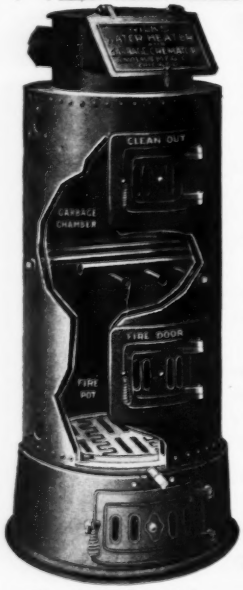

helps you to make a friend of every customer, which means repeat orders.

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Constructed so that garbage grate forms part of heating surface.

Constant circulation of water and staggered arrangement of tubes increase efficiency materially.

Deep fire-pot. Large, convenient doors.

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matter is placed before the town officials, they will see the logic of this move and endorse same.

New Jersey

Edwin Sternkopf, of 45 Pacific Street, Newark, will do the heating work in a new dwelling at 52 Bruce Street, for A. Guiliano.

C. P. Oschwald, of 839 South Fourteenth Street, Newark, will do the plumbing work in a new garage and service station at Bayden and Sheffield Streets, for Bonnell Motor Car Co.

George Snyder, of 728 South Twelfth Street, Newark, has the contract for the plumbing in a new garage at 88 South Twelfth Street, for Louis Williams.

J. J. Holden, of Lyndhurst, is doing the heating work in a new residence for E. L. DeWolfe, at Nutley.

Jaehnig & Peoples, of Newark, have secured the contract for installing the heating system in the new Shrewsbury Avenue public school at Red Bank.

Henderson & Co., of Irvington, will do the heating and ventilating work in the new fire engine house on Cotthart Street, Newark, Jaehnig & Peoples, of Newark, will install the plumbing.

Jas. Wallwork, of Kearney, will install the plumbing in two new apartment buildings on Dodd Street, East Orange, for Harry Kolodin.

Pennsylvania

Philadelphia and Vicinity.

Wm. J. Burlingame, of 3524 Haverford Avenue, has entered government service in the Quartermaster's Department, where he has charge of supplies. His plumbing business will be carried on during his absence by his uncle.

C. M. Sheldrake, of 1500 Ridge Avenue, has secured the plumbing contract on the building of the Municipal Court of Philadelphia.

George Wismer, of 523 North Fortieth Street, is installing the plumbing system in the Pennsylvania Railroad Y. M. C. A. Building.

At the recent quarterly meeting of the Northwestern Master Plumbers' Association held in Sharon, Pa., three new members were initiated, George L. Pfans and George Blunt, both of Youngstown, Ohio, and George McNutt, of Sharon, Pa. The next meeting of this association will be held in Meadville, Pa., on Thursday, February 14, 1918.

Georgia

Atlanta and Vicinity.

Smith & Guest, of 41 Luckie Street, have received contracts for the installation of vapor heating systems in the Piedmont College, Demarest, Ga., the Baptist Church, Madison, Ga., and in H. A. Caruther's residence, at Windsor.

National Director W. S. Loftis, when seen in his office at 2 Cone Street, said that he had just completed his job at Camp Gordon and was now so busy with association affairs that he did not have time to give "Domestic Engineering" a list of the many large contracts which he has recently secured.

Tennessee

Nashville and Vicinity.

The city of Nashville loses the service of one of its most efficient men, W. J. Donnelly, whose resignation as city plumbing inspector has been accepted by the city commission. On the occasion of his retirement, after several years' service, Mr. Donnelly submitted to the commissioners an interesting report covering the work of his department from January to November. Mr. Donnelly who filled the position of plumbing inspector in an energetic and efficient manner from the time he first became connected with the department several years ago, will retire to private life. He is to be succeeded by A. B. Vaughn, a well-known plumber of the city, who is already making arrangements to take charge of the office. Mr. Donnelly's final report, which shows a very active year for the plumbing department, follows in part:

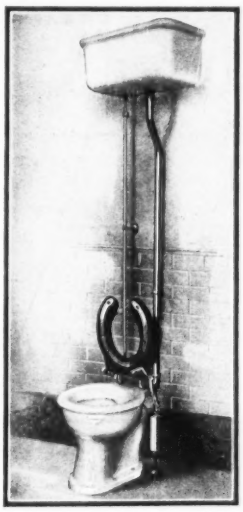
"I herewith submit report for the plumbing inspection department for the first eleven months of the year 1917. While there has been comparatively little plumbing work installed, this has been a very good year thus far from a sanitary standpoint, and it is gratifying to note the interest taken by the public, both inside and outside the city, in procuring sanitary plumbing. One evidence of the interest taken in sanitary work was the good vote given the sewer bond issue in the recent election, and it is a source of great satisfaction to know that the city is soon to have an adequate sewerage system, which will do more than anything else toward eliminating epidemics of typhoid fever and other dangerous contagious diseases.

"Following is a table showing activities of the plumbing inspection department during the period covered by the report. Number of inspections made with aniline for seepage water in basements (to find whether or not same came from sewer), 78; number of complaints received from health department and public in regard to insanitary conditions in plumbing work, 215; number of inspections made on plumbing work installed outside of the corporate limits (by special requests of architects and builders), 31; work changed in old and new houses on account of insanitary installation of plumbing, 194; work condemned in old houses for not being properly ventilated, 169; total number of inspections on all class of work for the eleven months covered by report, 4,719.

"Following is a table which shows the number of permits for plumbing work issued each month, beginning with January and including November:

Month	Fixtures	Sewer Connections	Septic Tanks
January	92	8	4
February	302	17	2
March	399	26	7
April	92	14	5
May	92	17	4
June	283	15	3
July	242	13	1
August	324	12	3
September	39	5	1
October	89	7	1
November	49	18	1
Total	2,003	152	32

The number of sewer notices served, where new sewers were installed was 296. Fee collected for installation of fixtures aggregated $1,001.50. Total inspection fees amounted to $1,369.50.



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The Main Feature

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has only one part —is located above water line, and float is arranged to insure complete syphonage.

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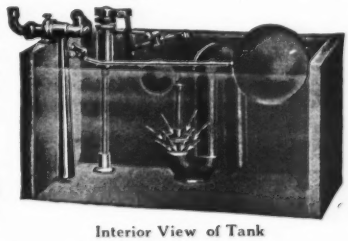

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Uniform Standard Non-Porous

Will not leak air

Guaranteed for 150 lbs. steam working pressure.

We also make a high grade line of Valves for Steam, Water, Air and Gas.

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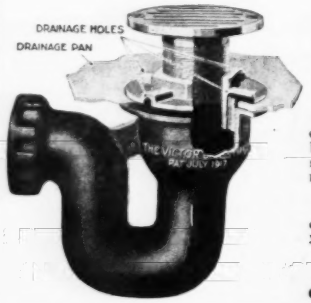

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Valve can't work open and leak. The improved stuffing box does the trick.
Made of red metal. Incomparable finish. Triple nickel plated.

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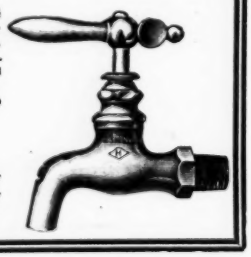

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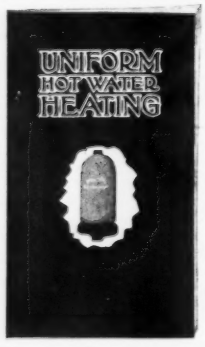

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Just what you want for that next job.

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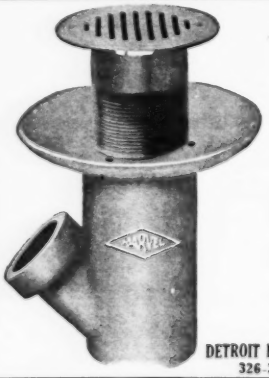

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Adjustable Shower Trap

embodies the double drainage principle.

Used by most discriminating plumbers. The trap you will prefer after giving it a trial.

Cast iron, black or galvanized. Tapped 2-in. iron pipe.

We make a complete line of the famous MARVEL Traps.

Order from your jobber.
Made by

DETROIT MARVEL BRASS MANUFACTURING CO.
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Ohio

Cleveland and Vicinity.

The Stamberger Co., Mayfield Road, has been awarded the plumbing contract for the new glass factory and warehouse of the National Lamp Works, to be built at 1152 East 152nd Street, at a cost of $200,000.

E. H. Bonhoff, of 2850 West Twenty-fifth Street, is now engaged in installing the heating in the new $12,000 residence and garage for I. H. Hildebrandt, on Scranton Road.

The Koestle Plumbing Co., of 11612 Detroit Avenue, has the plumbing contract, and E. F. Wolf, of 11711 Detroit Avenue, the heating contract on the new residence for R. J. Vlach, at 2600 Hood Avenue.

H. Sweesy, of 8620 Hough Avenue, has the plumbing contracts for eight residences to be erected at 1652 Hillcrest Road, Cleveland Heights, for the McPike Gardiner Building Co.

A. J. Schreiner Plumbing Co., of 5303 Clark Avenue, has the plumbing and water heating work on three new residences on Chatfield Road, Cleveland Heights, for the Cedar Coventry Land Co.

The Maskell George Co., of 1148 Prospect Avenue, has the plumbing contract, and the Home Furnace Co., of 3309 St. Clair Avenue, the heating contract on two new houses on Granger Avenue, Lakewood, for the Shobe Construction Co.

Other Cities in the State.

The Niles Plumbing & Heating Co., of Niles, has recently secured contracts for installing plumbing and heating systems in Dr. Klinger's new $50,000 residence on South Main Street, in G. J. Fiske's $20,000 residence on North Main Street, and in Herbert Webb's $20,000 residence at the corner of Hartzell and Robins Streets.

Dominic Marino, of 2144 West Federal Street, Youngstown, suffered a loss of $150 on Thanksgiving night, when his safe was broken open by burglars.

Members of the Youngstown Master Plumbers' Association are congratulating themselves on the good results obtained by the plan adopted some time ago of enrolling every apprentice in the plumbing course established in that city by Prof. Arthur Bateman, of Chicago. The instruction obtained by attending this course is proving very valuable to all the apprentices.

J. C. Heifner, plumbing and heating contractor, at Ashland, is now settled in new and larger quarters especially fitted up for his business. The premises are 48 by 65 feet with two floors and basement. He has added electrical contracting, and starts in the new location with two $2,000 contracts for plumbing and electrical work.

Fire did about $500 damages in the plumbing shop of Bissell & Deer, of Wooster, on the morning of December 2nd. The loss was covered by insurance.

C. A. Koltmeier, one of the progressive plumbers of Ashland, is doing the plumbing and heating work in the new Farmers' Bank Building, a three-story structure.

Edward B. Stroup & Co. is the name of a plumbing firm which has recently started in business at Girard. Mr. Stroup was formerly connected with the plumbing and heating concern of Gannon & Carey, of Erie, Pa. Among the more notable contracts which the new firm has secured are the installation of plumbing systems in 400 houses for the Carnegie Steel Co., and the contract for plumbing the new Bell Telephone Exchange building at Girard, and the new high school at Niles.

Kentucky

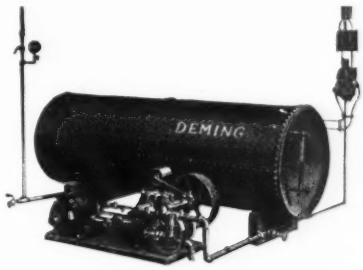
Louisville Master Plumbers File Suit for Profit on Government Work.

A petition in equity to obtain control of $18,500 and one-half of one-half of all further monies paid by the government on the plumbing contract on Camp Taylor, Louisville, has been filed in the Chancery Branch, of the Jefferson County Circuit Court, the petition being filed for and by the members of the Louisville Master Plumbers' Association, naming each of the active members in good standing, the suit reading F. S. Schardein & Sons Co., et al., against P. H. Meyer, Jr., and the P. H. Meyer & Co. Apparently there is a general misunderstanding between Mr. Meyer and the members of the Louisville Master Plumbers' Association. The total profits of the plumbing contract were in the neighborhood of $40,000, one-half of which were turned over to H. J. Scherich, while the other half was to be paid to P. H. Meyer, Jr., as representative of the Louisville Master Plumbers' Association. The sum of $37,000 has already been paid, and of this sum Mr. Scherich has received his half, while the remaining $18,500 paid to Mr. Meyer has been placed in government Liberty Bonds and is held in trust by the Louisville Trust Co. pending the outcome of the suit before the court. The status of the case as set forth in the suit, and as told by the officers of the association shows that early last summer, or spring, the government let a general contract to Mason & Hanger, on a percentage basis, to erect the big camp at Louisville. The Louisville contracting house of Johnson, Hieatt & Scherich, were also bidders, and later Mason & Hanger placed several sub-contracts with this concern, and later decided to let the firm figure in the plumbing contract, as it operated a plumbing department in connection with its general contracting.

The Louisville Master Plumbers' Association also endeavored to land the plumbing contract for the members, and took the matter up with Mason & Hanger, who agreed to receive a committee from the plumbers' association, and one from the Johnson, Hieatt & Scherich organization, in an effort to select a committee to name members from each organization to form a partnership or firm to handle the contract. The master plumbers as an organization could not figure in the contract letting. The first committee was composed of five members, George Schardein being named as chairman, and this committee met with officers of Mason & Hanger, and of Johnson, Hieatt & Scherich. Mr. Meyer was a member of the plumbers' committee. This committee was reduced to two members composed of Meyer and Schardein.

It was agreed that the association would furnish all the men possible for the work, and co-operate in every way possible, some co-operating by donning overalls and others by supplying labor, it being too big a job for any one individual, and this being the reason for the organization getting into it. The question of splitting the profits, "50-50" between the organization and Scherich and then of dividing the association's share equally between all members in good standing, was agreed to, it is alleged. It was agreed that Mr. Meyer would represent the association, and that the leading master plumbers would handle the positions of superintendents, foremen, etc., these men to draw regular salaries.

All was well and good, everyone apparently understood the agreement the same way. Mr. Meyer as a con-



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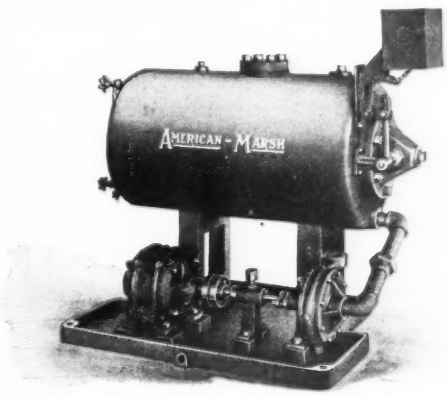

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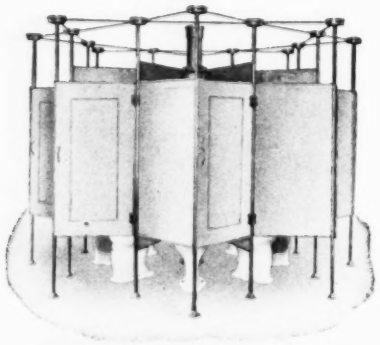

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tractor could not very well draw a salary from the government, but later the association fixed this matter by arranging to pay Mr. Meyer the sum of $500 per month for his work as representative of the association in handling the work. The superintendents, foremen and other employes were paid by the government for their actual work.

George Scherdein, C. C. Hieatt, H. J. Scherich and P. H. Meyer went to the camp site in a body, looked over the situation, selected the site for headquarters, and mapped out the line of work. Mr. Schardein was named general superintendent, and Joe Bywater assistant. All the better positions were placed with master plumbers, while some donned overalls and did journeyman work, the big idea being to complete the contract on time for the government.

The association kept its men on the work until it was completed, fulfilling its part of the obligation and finishing the work in time for the government. At this point it is alleged that Mr. Meyer would not discuss the situation, and arrangements were made whereby the money was tied up, and placed in trust until such a time as an agreement could be reached. As this could not be done without getting into court the association has filed suit, paying attorneys $500 as a retaining fee, and a nice percentage of the amount in question in case the fight is won. From the sum in trust arrangements have been made to deduct the sum of $2,500 to be paid to P. H. Meyer, Jr., for five months' work on the camp up to November 30, 1917, the work having started on June 30th. The plumbers' association is represented in the case by Judge James P. Gregory and B. K. Marshall, while Ben F. Washer represents P. H. Meyer. The case promises to be a hard fought one, which will result in much of the profits derived from the contract being lost to the attorneys and in court costs.

Louisville and Vicinity.

F. A. Clegg & Co., of 110-112 South First Street, have recently secured the following contracts: Installing hot-water heating system in C. C. Mengel's residence at Glenview; installing gas boiler and remodeling heating system in J. V. Reed Co.'s building, and remodeling heating plant and installing new boiler in the L. & N. R. R. Co.'s depot at Montgomery, Ala.

The Associated Press carried a story of much interest on Sunday, December 2nd, from Indio, Texas, relative to the work of Lieutenant Leonard C. Matlack, Eighth United States Calvary, who with a small party of American soldiers crossed the border, and attacked a party of 200 Mexican bandits which endeavored to ambush the soldiers at Buena Vista. The engagement resulted in the death of thirty-six Mexicans, the killing of one American cavalryman, and the wounding of another. The Mexicans were put to rout, and Lieutenant Matlack lead his men back across the border without further mishap. Lieutenant Matlack is a son of W. H. Matlack, Louisville master plumber, who is secretary of the local and state associations. Lieutenant Matlack has been in the federal army for a number of years, and just recently received a commission, having been a non-commissioned officer for some time.

Brass thieves have again been taking liberties with the city of Louisville, the most recent being the stealing of the brass heads of the spraying nozzles from twelve two-horse street-flushing wagons. The thieves went right into the city stables to remove these brasses, and the flushers are out of commission until new parts can be obtained from the manufacturers.

Obituary

E. B. Sumpter.

E. B. Sumpter, of Bowling Green, Ky., a retired plumber and heating contractor, died on Sunday, December 2nd, following a short illness. His wife, a son and a daughter survive him.

John Sheahan.

John Sheahan, a well-known master plumber of Topeka, Kan., died at his home in that city last week in his 77th year. Mr. Sheahan was born in Ireland in 1840; came to America in 1849 and saw service in the Civil War. He had been engaged in the plumbing business at Topeka since 1884. Two daughters and six sons survive him.

Wm. P. Byrne.

William P. Byrne, a well-known plumber of Lawton, Okla., died at his home in that city on Sunday, November 25th, in his 74th year. Mr. Byrne was engaged in the plumbing business for many years at St. Louis, until 1900, when he moved to Fort Sill, Okla., where he was post plumber until 1915. His wife, three daughters and two sons survive him.

Henry F. Franke.

Henry F. Franke, a well-known plumbing and heating contractor of Fort Wayne, Ind., died last Sunday at his home in that city, after an illness of six months. He was taken ill with tuberculosis about eight months ago, at which time he retired from active business. His widow and eight children survive him.

J. M. Bonham.

J. M. Bonham, who many years ago opened one of the pioneer plumbing establishments in Oakland, Cal., died at his home in that city, a few days ago. He leaves a widow, a son and a daughter. Mr. Bonham was in his younger days well known locally as an athlete, and only two years ago won a hero's medal for rescuing a youth from drowning in Lake Merrit, near Oakland.

Charles W. Carr.

Charles W. Carr, for many years identified with the plumbing business in Portland, Me., and formerly an alderman, died in that city on November 28th, at his home, 165 Cumberland Avenue, where he had lived the greater part of his life with Mathew Burke and family. Mr. Carr served three years in the city council and for two years was a member of the board of aldermen, representing the Second Ward. He was identified with the plumbing business almost from the time he left school. For the past eight years he has been traveling salesman for E. F. Butler & Co., jobbers in plumbers' supplies, of Boston, and his territory consisted of Maine, New Hampshire, Vermont and Massachusetts. One of the most popular young men who ever served in the city government, Mr. Carr also had numerous friends in other cities, which he visited. He was a member of Portland Council, Knights of Columbus, Portland Council, United Commercial Travelers, Portland Yacht Club and Portland Power Boat Association.

Born in Portland, Mr. Carr graduated from the North Grammar School and Portland High School. He was a delightful companion socially, an interesting conversationalist and always took keen interest in current events. He never married.

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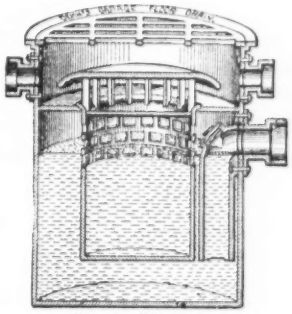

Fig. 62. Patented.

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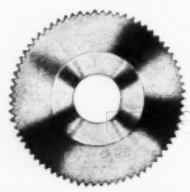

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MODERN PLUMBING FOR EVERYBODY UNDER THE PARTIAL-PAYMENT PLAN.

By C. W. McCarty.

A PLAN, which, if developed, will no doubt be of vast importance to the plumbing trade of Indianapolis is one that was proposed recently at a meeting of the Indiana Sanitary and Water Supply Association and which is being considered seriously by the Indianapolis Water Co. as a means of increasing its water consumption.

The method—a sort of a dollar-down-and-the-rest-in-weekly-installments, or some other partial-payment proposition, is patterned after the ones used by gas and electric companies and provides a means of financing sanitary improvements, such as the installation of bath tubs, toilets and other plumbing fixtures. If put into effect—and there is every indication that it will be—the plumbers of the city will be made the selling agents, thus providing a substantial increase in business for them.

The records of the Indianapolis Water Co. show that only two-thirds of the available water business in the city is on the company's books. This fact, combined with statistics gathered by the Public Health Service, showing that the Indianapolis percentages of population without sanitary conveniences are slightly below the average, prompted Robert A. Butler, publicity expert for the water company, to suggest the partial-payment plan. He contends that with this plan in vogue the small householder can more easily avail himself of a good water supply and sewerage system, and, at the same time, eliminate unsanitary conditions due to open vaults and unsafe wells.

Mr. Butler, in his paper to the members of the Indiana Sanitary and Water Supply Association, called attention to the fact that in the past it has been the custom for sanitary engineers and health enthusiasts to pass over the opposition to sanitary progress by the poorer classes, without any attempt at a solution for the problem for the individual small house owner. His scheme, the first public exposition of a study of these conditions, provides for the organization of a funding company, or the assisting company, with sufficient capital to finance the cost of the plumbing.

This plan would enable the funding company to tell the property owner to hire any plumber he desires and select any fixtures, with the understanding that the funding company pay the entire costs and the property owner have two years or so in which to repay the funding company. This, Mr. Butler points out, would make the plumbers of the city the enthusiastic boosters of the funding company and at the same time would aid them in boosting their business.

The following abstract from Mr. Butler's paper explains the plan more in detail:

Indianapolis differs little from all the cities of the state and the nation. It has its big problem of extending sanitation to cover the territory, where sanitation is blocked by poverty. It has its problems of sewage disposal, and its open vaults and its uncertain, unsafe wells. It has its enlightened citizens, who would be willing to make their homes modern, if they could, and it has those who are indifferent to the health of others as well as their own health.

In Indianapolis, as in every other city, there is another side to the question, for here, as elsewhere, there

are freeholders struggling to retain a feeble grasp on titles or to acquire homes by carrying a burden of debt.

Analysis of the ownership of property in Indianapolis, that is not modern, reveals a condition contrary to a popular view. Small properties, that lack modern sanitary equipment, are not held by grasping big business men. They are either owned by those who are struggling to make investments at the ratio of rent, or by the moderately well-to-do, who have invested their all in one rental speculation, and have not the additional capital with which to improve their holdings.

These people are good credit risks. They have shown their thrift in the purchase of their properties, and they are able to qualify by the moral standard that financiers now say they consider most thoroughly in making loans.

Yet no one has gone into the business of making it easy for them to care for their health. No one has offered to them the advantages now offered to the man of moderate means who would own a touring car. The opportunities of financing modern sanitary necessities have long been neglected.

The little home with its well water supply, its lack of sewers and its open vaults must give way to water service, sanitary sewers and sanitary closets. Some way must be found to finance these improvements without throwing too great a burden on these owners.

Have not the distribution of automobiles pointed the way for the distribution of sanitation?

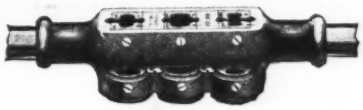
Today, if you wish, you may go to any automobile dealer and purchase an automobile by the payment in cash of half or less the list price. A funding company will supply the rest of the purchase price and so arrange the deferred payments that you may make one a month for a reasonable period. The automobile is delivered to you under a lease and the title remains with the funding company until the last payment is made. Insurance, interest and brokerage make this an attractive investment from the standpoint of the funding company, and the everlasting longing of the American purchaser for more luxury is the incentive that makes the business possible.

Why not apply the same principle to sanitation? Why not make it possible for the man, who owns a small property, to have sanitary plumbing installed in his home and the cost thereof extended over a reasonable period?

Electric light companies are wiring homes for electricity on this theory. Gas companies are installing ranges on payments. They have the sales and the collection systems already in operation, and the addition of appliance accounts is simple and involves little cost. The manager of the Peoples Gas, Light & Coke Co., of Chicago, recently asserted that the greater agency of development in the manufacturers' field today was the partial-payment plan of selling appliances. His company has more than 600,000 of these partial-payment accounts on its books.

The same method financing can and will be applied to water service and modern sanitary plumbing in the near future. It is a problem that confronts water companies and sanitary engineers all over the country, and it is a solution that means more services on their mains, the use of more water, and plumbing fixtures and the improvement of the health of whole communities.

In Indianapolis there is an outlet from the mains of the water company for every 7.5 persons in the city. The average size of the family is five. It follows that the business of the water company is 33⅓ per cent less than it might be. This one-third represents the field of prospects, and any merchandising expert will say that one-



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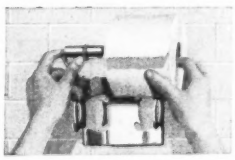

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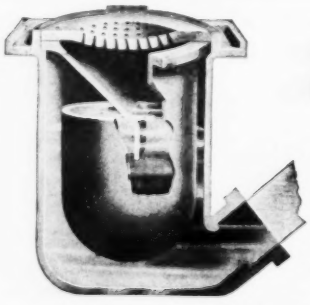

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third of the whole of the city's population is a desirable field to cultivate.

With one-third of the city as field, there is necessary to the development of business, capital sufficient to equip the possible user of water for its enjoyment. The installation desired in the class of homes in the city that now have no water service, has been estimated at a physical cost of from $100 to $250, according to the size and location. Taking the lowest figures as a basis, interest at 6 per cent for two years and a brokerage charge of 6 per cent could be added, and the installation made a partial payment cost of $4.92 a month for twenty-four months. To this should be added the cost of water, not exceeding $1 a month, making in all a charge against the property of $5.92 a month, or approximately 19.7 cents a day.

This should prove a fairly attractive proposition for the man with a small property whose concern is a safe water supply such as is furnished by water utilities. Other advantages such as baths, and toilets will follow quickly on the heels of the first installations and their costs will be relatively small.

Brokerage charges should be no greater for the large installations than the small, if based on cost, but policy might dictate a sliding scale in order that first costs of installation be reduced.

The organization of a funding company with sufficient capacity to handle this business should not be difficult. Capital, of course, would demand an ample margin of security, but it is the opinion of legal authorities that this security could easily be provided.

Two methods have been suggested for the protection of the capital necessary to make a home sanitary. Indiana laws provide for a lien against property so improved to protect the capitalist who makes the improvement. The process, however, is not without its troublesome delay and risks, and, unfortunately, it is possible for more than one lien to be filed against a property, making it necessary at times for the satisfaction of all liens, in order to satisfy one.

A more applicable plan is the leasing of such fixtures as enter into the house to be improved. The cost of the fixtures in a modern home is not the major item of expense, but the fixtures are the necessary item to the enjoyment of sanitation. It is urged by plumbers and others, that no property owner who has once had plumbing fixtures installed, can afford to have them removed from a house. The removal is attended by such wreckage that the property would depreciate in value to a point far in excess of the cost of the fixtures and the labor necessary to sanitary plumbing. It is argued that an owner, who has profited by better rentals or greater conveniences, would exhaust every resource rather than suffer the removal of plumbing fixtures which have only recently been installed. Consequently those who have investigated the credit problem maintain that a lease drawn to cover the fixtures installed in the house and affording legal right to enter and remove these fixtures in event of non-compliance, with the terms of the lease, would in practically all instances be sufficient protection for capital, no matter how timid it might be.

It is also argued that the funding company would deal only with that class of persons who have demonstrated their thriftiness and integrity in the acquisition of property, and the moral risk would be of the highest class. However, it is to be presumed that some leases would fail in performance and then, with a proper lease, the funding company would be in a position to take a

lien for the labor done, or to remove the fixtures, if it deemed advisable.

Organization and operation of the funding company is possible at a small overhead cost. The amount of capital actually necessary is dependent on the size of the field, but a consideration not to be overlooked is the fact that each month brings part of the capital back for reinvestment, and with each monthly payment the individual account becomes more secure.

Operating expenses of the funding company would consist of three branches, promotion of business, investigation of risks, and collections. The expenditure necessary for the promotion of business will depend on the method of operation finally adopted.

Investigation shows that the great cost involved in installations such as are under consideration is not the plumbing, but the sanitary sewer, the very thing that sanitation demands most.

This cost is primarily not one of material, but of labor, and probably no one plumber has any advantage over another in doing it.

In the automobile business it has been found desirable to have the funding company separate from the sales agency. Perhaps this would be even more desirable in sanitary plumbing. Certain it is that if the funding company were holding out to each plumber an opportunity to do work and collect his money immediately, even though the employer is not in a position to pay him cash, every plumber in the community would become an enthusiastic salesman and the cost of sales would be greatly reduced for the funding company.

The ideal situation seems to involve the organization of a company with sufficient capital or financial backing to be able to say to the propery owner: "Hire any plumber you choose and select any fixtures you desire. We will pay the entire cost and give you two years in which to pay us."

Then, with the plumbers of the city the enthusiastic boosters of the funding company, the examination of the risks is the most important operating detail. It has been estimated that this work can be accomplished at a mimium fee of $5 a risk. The burden of showing title to the property is to be thrown on the applicant for a contract, and extensive investigation is not necessary. A manager of ordinary intelligence would be capable of judging the advisability of the contract and a single inspection of the property should be sufficient to satisfy him. The time element is not important, and his work could be so distributed as to make it least expensive.

For convenience of collection the water rental and the partial-payment should be payable at the same place, the lessee being billed for the total, the utility holding the funding company responsible for the water rental. A simple card system of bookkeeping and a stenographer supplied with suitable letter forms for prodding the delinquents should accomplish the collections without great expense.

Whenever it is possible for the small property owner to improve his property without shouldering a hardship in the form of a big initial expenditure, it will be easier to insist on sanitary improvements. The greatest argument against the condemnation of open vaults and unsafe wells will disappear. Laws designed to wipe out these breeders of disease will not be assailable on the grounds that they are confiscatory.

Property owners will benefit by increased value of their holdings. Renters will find properties more desirable. Water utilities will cut down their fixed charges

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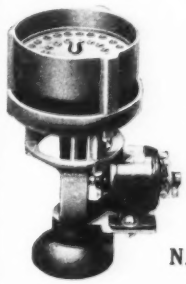

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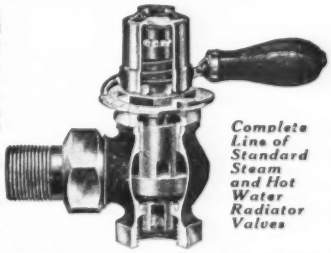

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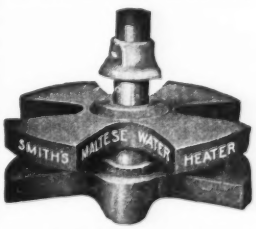

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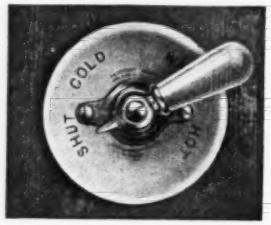

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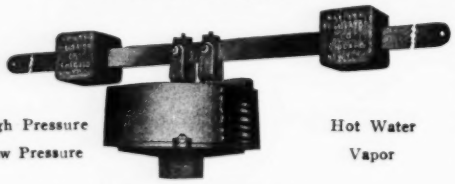

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Hot Water
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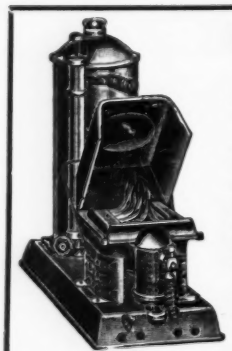

No. 25
DOUBLE BLAST
Tinners' Fire Pot, $7.25

Results Are What Count

Mechanics who use DOUBLE BLAST Gasoline Fire Pots know that the maximum amount of heat can be obtained from the minimum amount of fuel, by using a DOUBLE BLAST.

The letters of the words, "DOUBLE BLAST," aptly represent many important and superior points in the construction and operation of the DOUBLE BLAST. Read them over.

Double Burners
Odorless
Unrivaled
Blue Flame
Lasting
Economical
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Labor Savers
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Safety
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Leading jobbers handle them. If your jobber does not handle them, send us your order and we will ship direct. Additional information and circulars will be furnished upon application.

Double Blast Mfg. Co.
20th and State Sts., North Chicago, Ill.

as they increase the number of their patrons. Plumbers will find their business increasing and improved sanitation will bring about better health and there will be far more individual effort toward community health.

SHORT TALKS.

By W. W. Hughes.

(Continued from Page 397.)

The job in the first place was awarded to the low bidder. Here we find the low bidder lopping off enough money on job to buy a Ford car. A similar saving on another job would keep the car running for a year.

I am very much of the opinion that the master plumbers have given very little thought to this phase of the business.

I know absolutely that it is the rule, and not the exception, that the time spent going to the supply house more than equals the cost of the material taken away.

Under present conditions, in addition to the loss of time, there is a tendency for evil, which is surely harmful to the plumbing business, and that is the familiarity between your mechanics and the employes of the supply houses. This familiarity results in more or less conversation, a loss of time while rolling and smoking a paper cigar together, a few minutes going out to get a little drink, and last but not least the suggestion that the journeyman plumber should be hanging out his own shingle, which is all very well, providing the journeyman in question is the proper man to become a master plumber.

Invariably, when a journeyman plumber graduates from the ranks and becomes a master plumber, his first purchases are at the suppliy house, which supplied the bulk of goods to his former employer.

The conclusions arrived at are that the master plumber should carry a stock of reasonable size and variety. He should keep a "want book," and, as soon as stock is nearly exhausted, make a note of it and get a new supply. He should maintain some kind of a vehicle, preferably a motor car with a box behind. He should then see to it that his men are supplied with material on the job, instead of permitting them to go to the supply house.

Along the same line, it is advisable for the master plumber, when going to supply house for stock for which he cannot wait, to first telephone the supply house, give the man at the desk a list of what he is coming after, so that it will be ready for him when he gets there.

The application of these suggestions will result in a material saving of time and money, and this means greater profits to the master plumber.

Waterville, Wash.—D. J. W. Murdock, who has been in the plumbing business here, has closed out his business and will remove to Seattle.

Fowler, Ind.—William Sanders and George Klentner have purchased Richard T. Leadbetter's plumbing and heating business in this city.

Spokane, Wash.—Porter Bros. were the successful bidders for furnishing and installing sewer, water and lighting systems at Camp Lewis, near Tacoma for the United States Government.

Yes, Father Knew

"Father," said vivacious Vivian, as she lay in the hammock on the winter-resort hotel piazza, "this place seems just like home."

"Yes, it's the dearest spot on earth," promptly replied father, putting away his fountain pen after writing a check for that week's board bill.—"Froth."

QUESTIONS AND ANSWERS.

(Continued from Page 392.)

open at top, and air relief is obtained around manhole cover or through a hole in it, or through the top of septic tank somewhere. But here again we have an indefinite factor. The top may be air tight or it may not. That is why we prefer the capped vent shown in Fig. 2.

THE WATER PRESSURE IN PIPE TO EXPANSION TANK.

Editor "Domestic Engineering":—Does not the pressure upon a hot water system from the weight of water in the expansion tank, when connected to return at the boiler, help the circulation? Is not the circulation caused by pressure?

The pressure of a column of water being two for one, that is, one pound pressure to each two feet of height, should help to force the circulation in the system.

Springfield, O. J. B. H.

The theory advanced by correspondent as to the pressure exerted by the water in the expansion tank of a hot water system, when connected to the return of the boiler, is only partially correct. The water in the tank and expansion pipe is still—that is to say—is without circulation, and the pressure upon the system is a static or dead pressure which is approximately one pound for each two feet of height. The area of the pipe connection (expansion pipe) is however, so small that its effect upon the volume of water in the system is very slight.

The circulation of the water in the system is due to the difference in the weight or specific gravity of the water in the ascending and descending columns—otherwise, the flow and return pipes. For instance, at the point of greatest density (39.2 degrees Fahrenheit) one cubic foot of water weighs 62.425 pounds. When heated to 212 degrees (the boiling point), a cubic foot of water weighs a little less than 60 pounds (59.844).

The reason for connecting the expansion pipe at the bottom of the system is not particularly to gain pressure by the extra weight of water, but rather as a means to prevent the system boiling over through the overflow of the tank in case of hard firing of the boiler or from excess generation of heat due to using a boiler excessively large. When an expansion tank is connected at the top of the system it is easy, under such conditions, to boil the water in it and make steam, or to force the water out of the tank through the overflow. When connected at the bottom of the system this condition is overcome, making it practically impossible to boil the water out of the overflow.

New French Town.

The geography lesson was about to begin, and the subject of it was France.

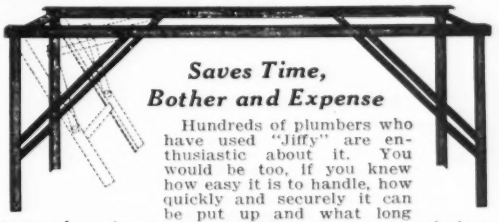
Accordingly, the teacher started off with the question: "Now in this present terrible war, who is our principal ally?"

"France," came the answer from a chorus of voices.

"Quite right," said the teacher, beaming. "Now can any of you give me the name of a town in France?"

A small boy at the back of the class almost fell over in his eagerness to tell; "Somewhere," he said, breathlessly.—"Pittsburgh Chronicle-Telegraph."

The "JIFFY" Collapsible Laundry Tray Frame



Saves Time, Bother and Expense

Hundreds of plumbers who have used "Jiffy" are enthusiastic about it. You would be too, if you knew how easy it is to handle, how quickly and securely it can be put up and what long years of service it will give. Made of heavy angle iron. Braces of heavy steel, coated with durable black paint. It's a money maker for you. Go see the "Jiffy" at your jobber.

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Our Booklet on modulated and Vapor heating is full of instructive matter. It also illustrates and describes our specialties. Send for your copy.

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Patented Jan. 26, 1915 is the only portable device of its kind.

No fastenings needed—will not upset, tilt or skid. Can be dissembled and packed in half a minute.

Light, compact, easy to carry as a suitcase.

Order one on 10 days' free trial.

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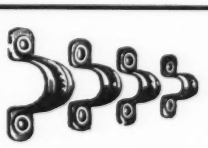

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"The Sanitary Way"

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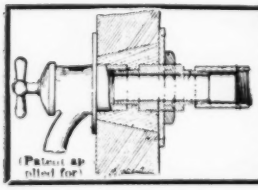
The Name

"DURABLE AS THE ROCKS"

¶ Every familiar phrase is an epitome of a truth. The almost unchanging shore line of a rock-bound coast gives this simile an indisputable force.
¶ The suggestiveness of comparison is always interesting; the truth of the phrase and an interesting comparison of DURABILITY was the subject of a double page announcement about "NATIONAL" Pipe (pages 6 and 7) last week.
¶ What did you think of it?

NATIONAL TUBE COMPANY, Pittsburgh, Pa.



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is a practical device for laundry tray improvements. Easily attached. Holds bibb in place by nut and washer arrangement. Leak-proof. Saves time and money.

Order from your jobber. Write us for circular.

THE LILGER COMPANY
1246 W. 72nd Place, Chicago, Ill.

THE FLOW OF STEAM AND VAPOR.

Errors and Obstructions Which Reduce Efficiency in a Heating System.

(Continued from Page 390.)

it is raised. This method eliminates the possibility of the water of condensation being carried with the steam into the upper level of the main, and it ensures dryer steam in the pipe beyond this connection.

Either of the methods described, if used when the main is exceptionally long, will greatly increase the efficiency of the system.

A fault in construction, so common as to be frequently noted, is the connection of drip pipes or bleeders directly into dry returns without making some provision to prevent the short circuiting of the steam into the return. No drip from any source, having a pressure of steam behind it, should be connected into a dry return without first

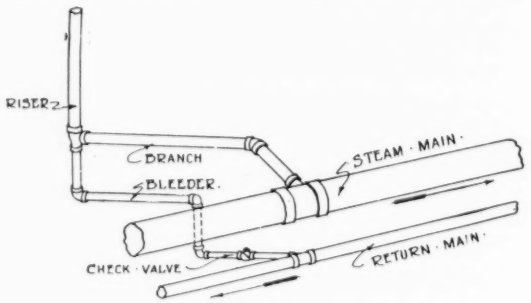

Fig. 8.

trapping or checking the connection. Fig. 7 illustrates a method of trapping the drip pipe. The vertical loop forming the trap should be of such length that the steam pressure carried on the apparatus will not lift the water out of it. It is well also to supply a plugged opening at the bottom of the loop to provide a means of draining it. Fig. 8 shows the application of a check valve for this purpose. Note that the drip proper and particularly the vertical leg of it should be much larger than the short horizontal connection to the return. This pipe, in which the check is placed, is reduced in size in order that the weight of water collecting in the larger pipe will easily move the clapper of the check valve. The use of a special light weight check for this purpose is advisable.

Injured Pride.

After a recent Zeppelin raid, when the worst was over, a resident went out into the town to see what damage had been done. In the darkness he heard a group of women talking loudly, and judging them a clue not to be neglected he followed them along an entry into the back yard of a house. The debate never ceased, but he was unable to get the hang of it until one of the women—the most eloquent—appealed directly to him. "'Ere," she said, "do you call it fair? T' bomb dropt in our yard, an' a bobby's gone and took it away—never even give me a receipt for it. It's our bomb."—"Manchester Guardian."

What She Did Know.

At an evening party the hostess had coaxed a protesting guest to sing. After the song she went up to him smiling. "Oh, Mr. Jenkins," she said, "you must never tell me again that you can't sing—I know now!"—"Argonaut."

SOMETHING ABOUT ICE AND HOW IT AFFECTS THE PLUMBING TRADE.

How Some Pipes Freeze and Burst, While Others Freeze and Do Not Burst.

(Continued from Page 388.)

loose and not strong. Perhaps the fatty matter in the cream is the cause of this. However, be that as it may, the frozen cream is pushed up out of the bottle like a piece of putty. The force, which does the pushing, undoubtedly is the expansion of the milk under it when it is changing from the liquid to the solid state. The last part of the milk bottle to freeze is the bottom and middle, and the expansion from this part seems to be exerted up through the cream stratum. It is only when relief is shut off by milk stratum being frozen close under the cream stratum that the expansion of the milk under the cream really bursts the bottle. However, this has but little bearing on plumbing, as the liquids we handle are not of a very viscous or yielding nature.

PAPER PIPES FOR WATER, OIL AND GAS.

The shortage of iron and lead in Germany has led to the invention of paper pipes as conduits for water, oil and gas. Two different processes of making these are employed and they have been submitted to an extensive series of tests at the Royal Institute for Testing Materials. Their merits and demerits are set forth in the official "Mitteilungen der Königliche Material Prüfungsamt," says "The Literary Digest." In the process of A. von Valois the tubes are made by rolling the sheets of paper around a mandrel of the desired dimensions until the required thickness is obtained, solidifying by means of a suitable adhesive and covering with a layer of a special coating. These tubes are not appreciably affected by the prolonged action of illuminating gas, and those which were allowed to stand full of water for several weeks did not swell nor exhibit any loss of resistance. They not only weigh far less than pipes of iron or lead—in fact, only from one-sixth to one-tenth as much—but they resist three or four times as much pressure for a given thickness.

The joints are made by slipping sections of other tubes over the ends of the pipes and filling in the spaces by a suitable composition. Unfortunately the jointed pipes burst at a much lower pressure than do the separate tubes; hence they sometimes give way at the joints. Tests of their resistance to exterior pressure give an average considered sufficient to resist the pressure of the earth provided the tubes do not gradually become sott.

Other tests were made with the so-called "Pertinax" tubes, which are made of a paper impregnated with synthetic resin and rolled under tension. Their absorption of water makes their use inadvisable for that liquid, but they gave excellent results when used to carry oil, a fact which is explained by the well-known resistance of synthetic resins to oils.

Finally, another series of tests showed that these pipes are not fitted for construction uses, since, while their resistance to traction is sufficient, their resistance to compression and their elasticity are both too feeble.

Bids will be called for shortly for the construction of Boston Store Block, at Main and Third Streets, Salt Lake City. This will be a seven-story department store and office building.

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Simple Sanitary Satisfactory
Designed for general use, and especially where hard usage is unavoidable. Lever or push button action.
Write for our Special Sample Valve Offer.
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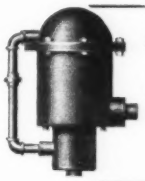

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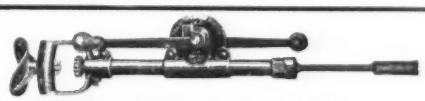

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not only cuts and threads pipe perfectly, but cuts your labor costs as well. Requires about one-third the time spent on hand work. Can be used either in the shop or on the job. Light, simple, compact, durable.
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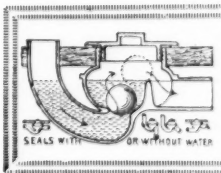

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For Wash Bowls, Sinks, Baths and Wash Tubs
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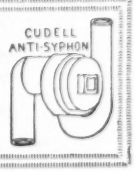
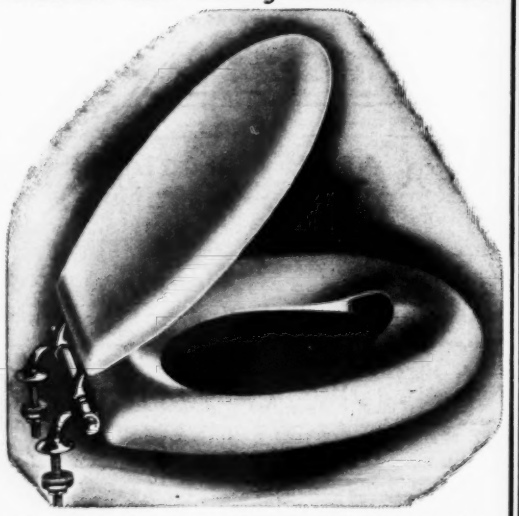


Made As They Should Be



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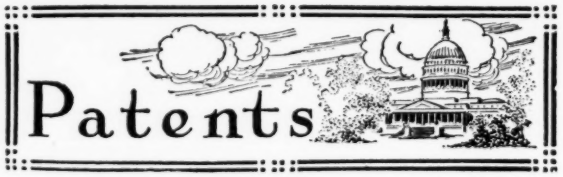
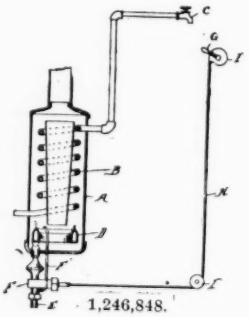
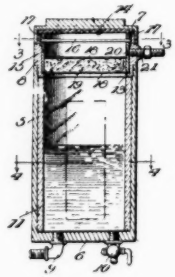


Plumbing Department.

1,246,848. Water Heater. Frank K. Berry, Calhoun, Mich., assignor to A-B-Stove Co., Battle Creek, Mich., a corporation of Michigan. In a water heater, the combination with a heating coil, a tap located at a remote point therefrom and a connection between said coil and tap, of a gas burner, a valve for controlling the supply of gas to said burner, comprising a gate longitudinally movable from closed to open position, a spring for normally closing said gate, a casing having a pocket into which said gate is pressed in the closed position of the valve, said pocket having a vent connection to the gas outlet passage, and a pull connection extending from said valve to a point in proximity to said point, permitting control of the gas valve independently of the water connections.

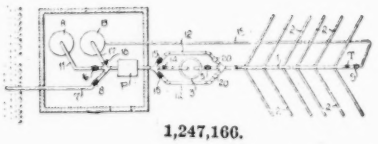


1,246,848.



1,247,118.

1,247,118. Filter. Henry Kershaw, Chicago, Ill. A filter comprising a vessel having a bottom inlet and adapted to hold a wash liquid, and having an outlet above the liquid level, a neck attached to the top of the vessel and having an internal flange, a sleeve in the neck and seating on the flange, a cap closing the neck and engaging the sleeve to hold the same seated on the flange, and a screen carried by the sleeve, said screen being located between the top of the liquid and the outlet of the vessel.

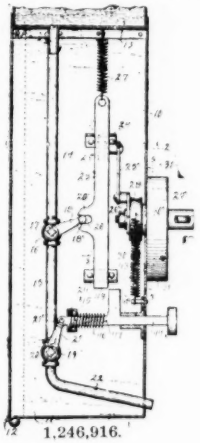


1,247,166.

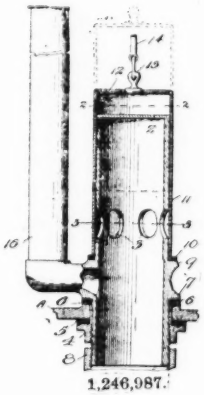
1,247,166. Apparatus for Treating Soil. John Steelquist, Portland, Ore. An apparatus of the class described including a conduit having laterals in communication therewith, a reservoir into which one end portion of the conduit extends, a piping extending into the reservoir, a pump interposed in said piping, a source of fluid supply, a lead in communication with said source and the piping, a valve interposed in the piping intermediate the connection between the lead and said piping, a by-pass in communication with the piping and with the conduit and arranged exterior of the reservoir, a valve interposed in the conduit intermediate the reservoir and the point of communication between the by-pass and the con-

duit, a valve interposed in the piping intermediate the reservoir and the point of communication between the piping and the by-pass, and a check valve interposed in the by-pass for preventing retrograde flow therethrough.

1,246,916. Soap Dispenser. William F. Hatch, Milwaukee, Wis., assignor to B. J. Johnson Soap Co., Milwaukee, Wis., a corporation of Wisconsin. A soap dispenser, comprising a reservoir for holding a fluid soap, a casing adjacent thereto, a measuring tube positioned in the casing and connected to the reservoir, a controlling valve for controlling the flow of soap into the measuring tube, a discharge nozzle connected to the measuring tube and extending out of the casing, a discharge valve controlling the flow of soap from said measuring tube, a reciprocal member normally holding the controlling valve in closed position, means for moving said valve to open position, and a member normally holding the discharge valve in closed position, but movable to a position to open said valve, said valve controlling members having portions which are movable to positions in the paths of movement of each other to prevent the opening of one of the valves while the other valve is in open position.



1,246,916.



1,246,987.

1,246,987. Flush Tank. Carl Nuessle, East Moline, Ill. In a flushing device, the combination with a tank, and its outlet pipe extending into the tank and having a closed top, and apertures in the pipe near the bottom of the tank, of a tubular cap fitting over said pipe to close the apertures, and means for lifting the cap, whereby the apertures are uncovered and a vacuum is formed in the cap above the pipe and suction therefrom causes air and water to rise between the pipe and cap to insure a slow return of the cap to closed position.

1,247,157. Water Valve for Instantaneous Water Heaters. Edwin Ruud, Pittsburgh, Pa., and Herbert S. Humphrey, Kalamazoo, Mich., assignors to Ruud Manufacturing Co., Pittsburgh, Pa., a corporation of New Jersey. In a water valve for instantaneous water heaters, the combination of a casing having a water inlet and an outlet, a piston movable in the casing between the inlet and outlet, the piston formed with a central chamber open at its ends for the passage of water, a check valve movable within the chamber for closing one end thereof, a spring confined within the chamber for opposing opening movement of the check valve, means made operative by the movement of the piston for opening the check valve, a normally closed gas valve, and means actuated by the piston for opening the gas valve.

1,247,374. System of Water Distribution. Lewis W. Chubb, Edgewood Park, Pa. The combination with a

"Here is one of my best sellers," remarked a Myers Dealer quite recently.

"Here is one of our best sellers" we reported back to him immediately, and

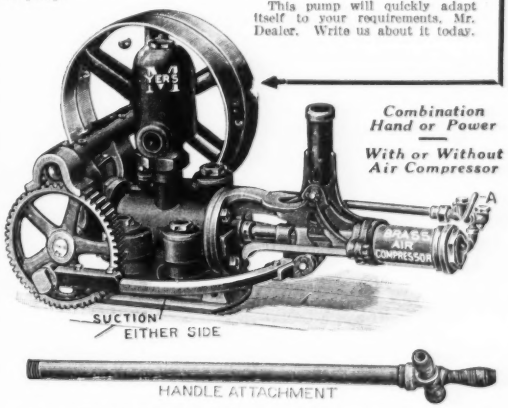
Here is one of the reasons—

The Myers Century Cog Gear Pump is an out-and-out Myers production. It is just as practical for use with open tanks as it is for pressure tank service.

When water in quantity is desired, start the motor or engine. If out of commission or only a small amount of water is to be used, remove one pin, insert Tee Handle in Socket and pump by hand—Nothing simpler in the world.

This combination is appreciated by both dealers and users, for few are the power pumps which permit of operation by hand because of the power required—The Myers Cog Gear Head is the difference—It overcomes the difficulty for it saves 33⅓% of the power required to pump.

This pump will quickly adapt itself to your requirements, Mr. Dealer. Write us about it today.



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The Rainbow That Lasts

The S. & K. Rainbow Compression Shampoo Fixture, made of highest grade materials throughout.
Workmanship and finish unsurpassed. Complete with sprinkler and hose. Price on request. Specify distance center to center of cock holes in ordering.

STREET & KENT MFG. CO.
549 Fulton Street
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LION TANK HEATER

The fact that a well-advertised article sells much easier than any other cannot be disputed.

The LION is the largest advertised and best known tank heater in the United States.

Made in six sizes—single, double and triple copper coil.

Send for literature.

Pittsburg Water Heater Company
Pittsburgh, Pa. And 42 Branches

Clean Sweep Traps

have been produced with a scientific consideration of their worth to the trade, each trap scientifically proven best for its distinctive use. Concentrate your mind on this fact. Under the abnormal conditions CLEAN SWEEP Lead and Brass TRAPS are the best and lowest priced traps today on the market in proportion to actual worth.

DETROIT SANITARY SUPPLY CO.
Sole Manufacturers
Second Avenue and Antoinette Street DETROIT, MICH.

Will not Clog or Stick

Automatic Noiseless

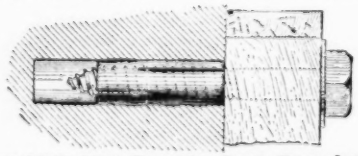
The DUNHAM VAPOR HEATING SYSTEM

Radiator Trap

For factory—office—store—apartment and residence heating. Insures full radiator efficiency. Ask for Bulletin No. 11.

C. A. DUNHAM CO., Marshalltown, Iowa
Branches in all principal cities in United States and Canada

UNIFORM EXPANSION



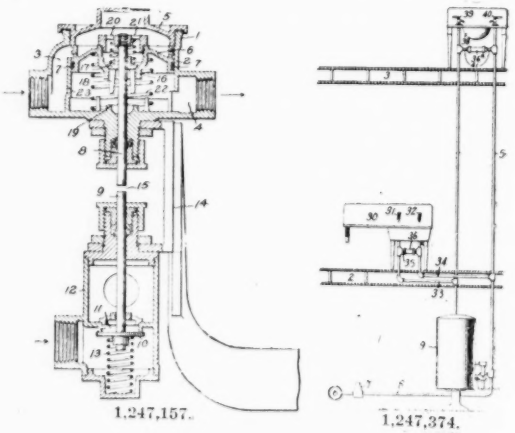
Showing Little Giant Expansion Screw Sleeve Installed.

The Little Giant Expansion Screw Sleeve does away with the ordinary wedge nut or pipe sleeve, and is more convenient to use. Try it.

Write for details and prices.

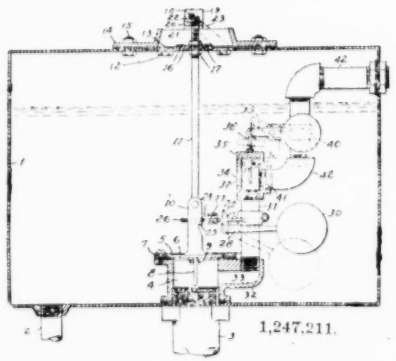
Stannard Mfg. Co., Springfield, Mass.

plurality of water distributing systems and means associated with the respective systems for drawing off water, of interconnecting means joining said systems for normally permitting a flow of water between said systems in either direction, and means associated with said interconnecting means for closing said interconnecting means under predetermined conditions of flow in either direction.



1,247,157. 1,247,374.

1,247,211. Flushing Tank for Water Closets. Addy A. Boss, Detroit, Mich., assignor of one-half to George Greisch, Detroit, Mich. In a device of the character described, the combination with a substantially air-tight tank having an outlet in its bottom portion, of means for admitting water under pressure to said tank and thereby compressing air in the top portion thereof, a valve controlling said outlet, means operable by the pressure of the air in the top of the tank for unseating said valve,

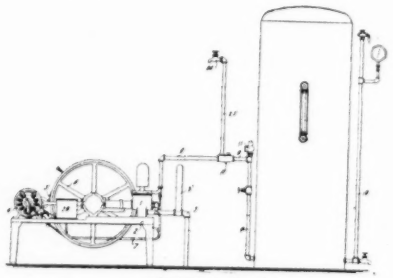


1,247,211.

a manually controlled device exterior to the tank for normally preventing the last named means for functioning, means adapted to retain the valve open after its initial unseating independently of the degree of air pressure in the top of the tank, float controlled mechanism for releasing the valve from the last named means at a predetermined level of the water in the tank, a pipe for venting the tank to the atmosphere, a valve controlling said vent pipe, and means for automatically actuating said valve controlled by variation in the water level.

1,247,544. Water Supply System. Hugh W. Kimes, Dayton, Ohio, assignor to the Vaile-Kimes Co., Dayton, Ohio, a corporation of Ohio. A water supply system combining a compression tank and piping for receiving and supplying water to the place of utilization, water pumping apparatus in connection with said tank for supplying water thereto, pressure actuated devices influenced

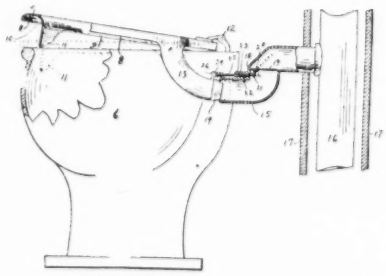
by different degrees of pressure in said piping and tank for controlling the operation of said pumping apparatus, a water check valve and pipe coupling member interposed in the piping to said tank, comprising a hollow valve casing, having an interior division wall with a valve seat equipped opening therethrough for passage



1,247,544.

continuity through the casing, a valve for reducing said opening area to a restricted passage to approximately withhold a tank draining counterflow of water, said casing provided with a by-pass opening for a direct pump service connection beyond the control of said valve.

1,247,176. Toilet Ventilator. Abram Swarzman, Sioux City, Iowa. A ventilator for a water closet having a bowl, including a tubular rim comprising a top and outer wall, a bottom wall secured to the outer wall and adapted



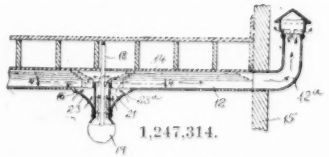
1,247,176.

to rest on the top of the bowl, and a flange depending from the inner edge of the top wall a distance below the plane of the top of the bowl, and disposed in spaced relation to the bowl and the bottom wall.

1,247,639. Ventilator Casing in Combination with a Stack. John Chafer, Cleveland, Ohio.

Ventilating Department.

1,247,314. Ventilating Apparatus. James Murray, Boston, Mass. In combination, a fixed horizontal ventilating flue located at the ceiling of a room and having in its bottom wall an air intake communicating with the top of the room and constituting an ejector element, and at



1,247,314.

one end an air outlet outside the room, a lamp located below the said flue and intake, and a vertical chimney extending from the lamp through said intake into the flue, and constituting an ejector element adapted to conduct a jet of hot air and products of combustion into the flue and utilize the force of said jet to lift air from the top of the room through said intake into the flue.

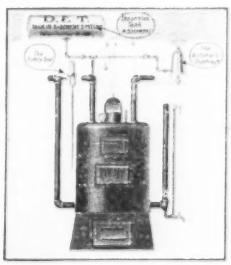
ECONOMY EFFICIENCY

This is a
Pierce Down Draft, Magazine Feed, Smoke Consuming, Heating Boiler
Saves Fuel Labor
Manufactured only by
PIERCE, BUTLER & PIERCE MANUFACTURING CORP.
Brooklyn Boston Worcester — NEW YORK — Syracuse — Philadelphia Baltimore Washington

Eagle All Lead **Roof Flange**

LEAD PIPE — Length, 6 inches; Diameter, 4½ inches
SIZE OF APRON — 15 inches Square
Made in Angles, 45 deg., 22½ deg. and Straight.
No Caulking To Be Done
Joints Lead-burned—No Solder Used
Flexible Adjustable Economical
Write for Circular and Prices.
Manufactured only by
The Eagle-Picher Lead Co.
CINCINNATI, OHIO

D & T Tank-in-Basement System



Increases circulation. Controls dampers automatically. No outside power needed.
Cheapest, most efficient, complete hot water heating system on the market.
Guaranteed for five years.
Write for new Booklet
D & T MANUFACTURING CO.
1911-13 Pine Street
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Save 20% to 30% Fuel Cost—and 10% to 20% in Pipes, Fittings and Labor
By Specifying
ADSCO HEATING
Atmospheric System, Steam or Vapor with the ADSCO Graduated Radiator Valve and ADSCO Regulator.
Write for Bulletin 133-E
AMERICAN DISTRICT STEAM COMPANY
General office and works—North Tonawanda, N. Y.
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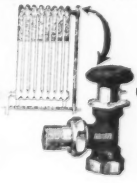

No Noise—No Leaky Valves—No Complicated Devices.
Valves open 50% give 50% radiation, not 90% or 10%.

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The charge for advertisements under this heading is $1.00 for 25 words or less, including heading and address; 4 cents each for additional words. To insure insertion, copy and remittance should reach us by Wednesday morning.

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WANTED — SALESMAN FAMILIAR with pumps, cylinders and well supplies, plumbing and heating material. A. Y. McDonald Mfg. Co., Dubuque, Iowa. 12-8

WANTED—EXPERIENCED SALESMAN for plumbing and heating supply business. One familiar with trade in Central and Northern Iowa, Southern Minnesota and Western Wisconsin preferred. Address 2478, care "Domestic Engineering," Chicago. 12-8; 15

WANTED—EXPERIENCED SALESMAN to sell a line of high grade plumbers' brass goods as well as a line of valves for steam. Furnish references and state age and if married or single. Address 2480, care "Domestic Engineering," Chicago. 12-8; 15

WANTED—SALESMAN. A MANUFACturer of heating boilers has an opening for a first class salesman. One who thoroughly understands the heating business. State experience and salary expected. Correspondence strictly confidential. Address 2479, care "Domestic Engineering," Chicago. 12-8

WANTED—SALESMAN, BY JERSEY jobber of plumbing and steam supplies. One familiar with Jersey and adjoining territory necessary. State experience in detail. References required. Address 2481, care "Domestic Engineering," Chicago. 12-8

For Sale.

FOR SALE—PLUMBING AND HEATing shop in county town of 2,500; sewers, water and hydro-electric power; rich, progressive farming community; little competition. Netted $2,400 last year; easily doubled by hustler. Good reasons for selling. Stock, work-car and tools worth $2,000 or more. What cash offers for January 1st acceptance? Ernest Wykes, Humboldt, Iowa. 12-8

FOR SALE—ENTIRE EQUIPMENT OF modern plumbers' brass goods factory: Turret lathes, drill presses, polishing lathes, gas engine, engine lathe, shaper, milling machine, coke furnaces, patterns for bath cocks, basin cocks, special patented goods, tools and equipment for making goods complete. Must be sold within thirty days. Address 2454, care "Domestic Engineering," Chicago. 9-15 tf.

Miscellaneous.

SELL YOUR SURPLUS COUPLINGS and fittings. Write us. The A. & J. Mfg. Co., 557 W. Lake St., Chicago. tf

WE BUY IRON PIPE COUPLINGS—spot cash. How many, either pounds or pieces have you of various sizes? Gwilliam Supply Co., 615 Christian Street, Philadelphia, Pa. 10-6,tf

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If you are looking for competent employes; or if you contemplate a change in position, have a patent for sale; wish to purchase or sell a plumbing and heating business; second-hand machinery or tools; form a co-partnership, etc., your advertisement on this page will put you in touch with the people you desire to reach.

The cost of insertion is only four cents a word and may mean many dollars to you.

"Reading" Specialties

for

Hot Water - Steam
Vapor and Vacuum
Heating
Embody Advanced Ideas

The Reading
Heater & Supply Co., Inc.
Reading, Pa.

Free for the Asking

This Catalog contains interesting details on

"Reading" Heating Specialties

Gives you the information you want regarding the **"Reading" Tank-in-Basement System,** modern installation methods, fuel saving, uniform heat, etc.

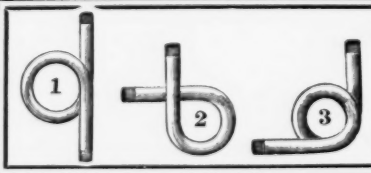
Send for your copy today.

The Reading Heater & Supply Co., Inc.,
Reading, Pa.

MARSH VALVES

See our Modulated Line in June 23rd issue.
See our Packless Line in July 7th issue.
See our Special Line in July 21st issue.
See our Union Bonnet Line in August 18th issue.
Globes and Gates, both Mill Supply and Radiator patterns will be shown in later issues.
We manufacture and furnish every style of valve required for piping a job or installing a heating system.
Write for catalogue and discounts.

Marsh Valve Co. Erie, Pa.



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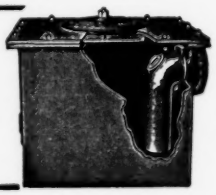
Be prepared to supply them and obey the law. For twelve years we have been manufacturing these, also in iron. Order a stock today from your dealer. If he does not carry them, write us.

Gwilliam Supply Co. 615 Christian Street, Philadelphia, Pa.

The Trap That Does The Work

Every sink you install should be equipped with the **Boston Grease Trap.** It collects and holds all grease and keeps the pipes free. Very large handhole makes it easiest to clean out. The **only** grease trap you will use after giving it a trial.

Write for circulars and prices.

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